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The International Journal of Orthodontia and Oral Surgery

A Monthly Journal Devoted to the Advancement of the Sciences of Orthodontia, Oral Surgery, and Dental and Oral Radiography

Martin Dewey, D.D.S., M.D., New York
Editor-in-Chief

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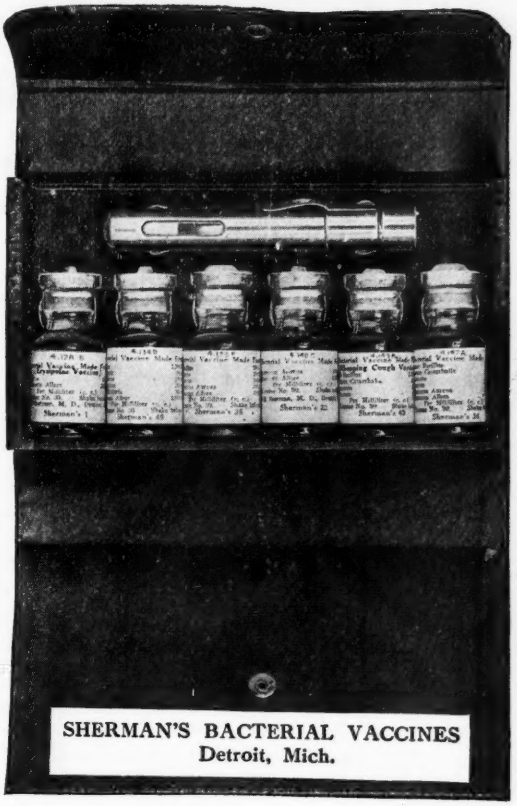

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VOL. VI ST. LOUIS, NOVEMBER, 1920 NO. 11

ORIGINAL ARTICLES

PRINCIPLES OF RETENTION IN ORTHODONTIA*

BY CALVIN S. CASE, M.D., D.D.S., CHICAGO, ILL.

PRELIMINARY

IT may be well for me to state that the paper which I am about to read does not pertain—except incidentally—to any form of technic, retaining appliances or plates. Its main object is to present certain principles of regulating which I have found indispensable to the permanent retention of certain inherited dento-facial malocclusions. Particularly those in Classes II and III, in which are found pronounced disto-mesial malocclusions with protrusions and retrusions of one denture or the other.

The principal claims of the paper pertain to the inadvisability of extensive reciprocating disto-mesial movements of the entire dentures to a normal occlusion with the intermaxillary force. It advises instead, the movement of the buccal teeth to a perfect interdigitating masticating occlusion, and the correction of the facial outlines with the required movements of the front teeth alone.

If there is one part of orthodontia more than another that is absolutely indispensable to the success of this specialty and its establishment upon a firm foundation as one of the arts and sciences, it is the permanent retention of regulated teeth.

We may possess high ideals in regard to the relations which the teeth and dentures should bear to each other and to the facial outlines. We may be able with our facilities and chosen methods to move the teeth in a manner and to positions which fulfill all the requirements of our understanding of perfect correction; and we may be justly proud of the really wonderful results which

*Read before the meeting of the American Society of Orthodontists, April 5-7, 1920, Chicago, Ill.

we, at times, are able to accomplish. But after all, what does this temporary pleasure and satisfaction to ourselves and our patients amount to, if we find in a few years that the very cases which create in us the greatest pride, are going back to their former malpositions and disharmonies, in spite of everything we have been able to do with retaining appliances. Or, if at the close of our operations proper we are conscious of the possibility and even probability of ultimate failure, judging from other similar cases that were corrected in the same way, and with the same proposed methods of retention. This naturally leads one to lose confidence in the high ideals of his profession.

The art of moving teeth in the correction of irregularities has been regarded in the past as so nearly the whole of orthodontia, that the retention of corrected teeth was largely considered a matter of course, and its importance, its difficulties, and its uncertainty of permanency were lost sight of, or regarded thoughtlessly as a very minor branch of the art of regulating. It is possible and even probable that the art of retention will never approach so nearly to an exact science as that of regulating, because of certain natural influences over which one can have little or no control. Yet it is nevertheless a fact that the principal failures along this line have been and are largely due, first, to a lack of appreciation of the forceful influences of heredity; second, to a wrong system of regulating which leads to placing too much dependence upon the normal locking interdigitation of masticating cusps; and third, it has been due to inadequate retaining methods and appliances, and the unfortunate tendency among a large class of orthodontists to avoid everything which demands considerable personal training in high technical skill.

To be sure, the occlusal interlocking of cusps and other harmonious relations afforded by a normal occlusion are of the very greatest importance to retention. This also is quite as important in those cases where a normal occlusion is not advisable, on the same principle that decidedly irregular teeth are often held in malpositions solely through the interlocking of the masticating cusps of abnormal occlusions.

And yet in no instance of regulated teeth can the most exact interlocking of masticating cusps be depended upon solely to combat the forces of heredity, or of even long-standing malpositions which have involved a considerable maldevelopment of the alveolar process and maxillary bones. Therefore, we are dependent upon retaining appliances or fixtures which will hold the teeth in their regulated positions and completely combat the forces of reaction toward every character of regulated movement, until nature is given a chance to restore or build a new foundation around the roots, to stabilize their new positions.

If the movements in these cases have been extensive, involving a number of teeth side by side moved in phalanx, as in the linguo-buccal movements in arch expansion, or extensive disto-mesial shifting of the buccal teeth to normal occlusion, or if a whole or a part of the movements has been in the nature of bodily movement, we are certainly up against a big proposition; and a proposition moreover, which we must successfully meet, or acknowledge that our profession of orthodontia is a failure, or at least that a large proportion of our most important and satisfactorily finished cases cannot be permanently corrected.

One of the most prominent orthodontists of New York City said to me, in

substance, a few months ago, that the practice of orthodontia was beginning to be feared by many of our best orthodontists as more or less of a failure. And when I asked him why, he said: "Because it is impossible to permanently retain a very large proportion of our regulated cases."

If this statement is true, coming as it did from one who is in close touch with the pulse of his profession, I must say that I regard it as one of the most healthful symptoms of our evolutionary progress that has arisen for many years in this department of dentistry. It shows in the first place, an appreciation of the indispensable importance of retaining the positions of our regulated cases permanently, not merely during the period of artificial retention, but in after years; and it shows also, that a very large proportion of orthodontists have deeply considered the seriousness of failures in this regard, and are not wholly satisfied with the retention of their previously regulated cases. Consequently, their minds may be open for a thorough study and possible application of some of the principles to which I am indebted for the correction and permanent retention of a large proportion of the most pronounced dento-facial disharmonies in my practice.

I believe it will be found that there are no easy winding paths that will reach that goal of permanency in retention of regulated teeth, or any sure paths which will not at times shatter the radical insistence upon long conceived ideals which have been and are regarded by many, as the most indispensable and unswerving principles of orthodontia.

If we have arrived at that stage in our progress when we fully appreciate the fact that permanency in the correction and retention of our regulated cases is the most important factor in orthodontia, and if it is a fact that in the advancing demands of bodily and other extensive movements which have increased the difficulties of retention, a large proportion of orthodontists are not fully satisfied with the final results in many of the most pronounced dento-facial malocclusions in their practice, then I think it is time to at least modestly ask whether it would not be well for us to stop and deeply consider some of the underlying principles of this subject of retention from the broadest possible viewpoint, and in doing so, to lay aside our petty partisan prejudices and get together as in a League of Nations, that the world may be benefited.

I think it will be admitted that our greatest difficulties in permanency of retention are found among the very cases which seem to be the most necessary to correct. I refer to those decided disto-mesial occlusal malrelations of the buccal teeth in Classes II and III in which are found those pronounced dento-facial protrusions and retrusions which we are always more than anxious to permanently correct.

In Class I malocclusion, in which by far the greatest variety of irregularities arise, nearly all are due to some one or more local causes which have attacked what otherwise would have been normal occlusions, and consequently, demand that the dentures be restored to their normal relations which nature intended they should occupy. In all corrections of that kind, permanency of retention can be assured, if a proper quality and degree of artificial retention is employed.

But with Classes II and III, the difficulties are greatly increased, because of the fact that the dento-facial malrelations pertain to the entire upper or lower

or both dentures, the buccal teeth as well as the front teeth, supposedly demanding according to the commonly practiced system, that the entire dentures be shifted disto-mesially to a normal occlusion, which can usually be accomplished with the intermaxillary force at almost any age.

If I may be pardoned in presenting a few previously published illustrations of former papers, I should like to briefly refer to some of the difficulties and failures of retention in my early practice of orthodontia as a specialty, which caused me to change my tactics in regard to treatment, and would have caused me to go back to the general practice of dentistry, had I not also discovered in this connection the retaining system which in its developed state has proved a Godsend in my practice.

In the winter of 1891 and 1892, I commenced the exclusive practice of orthodontia in Chicago. Previous to that, for nearly twenty-five years, I was engaged in the general practice of dentistry in Jackson, Michigan. During the later years of that time I had gained quite a reputation as an orthodontist

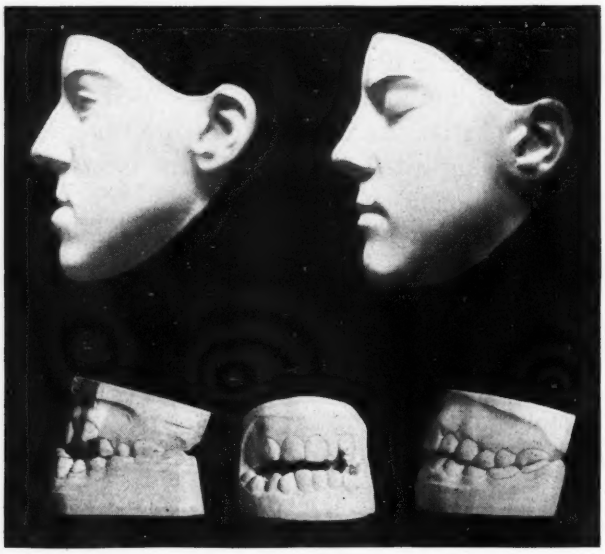

Fig. 1.

through papers which I had read before prominent societies. I had even given a clinic before the First District Dental Society of New York City on "The Angle System of Orthodontia," and I had also presented a paper published in the *Cosmos* in 1890 in advocacy of that system, as opposed to the system of regulating plates. It was because of a paper which I read before the Illinois State Dental Society entitled "Orthodontia," that secured me the appointment to the chair of Prosthetic Dentistry and Orthodontia in the Chicago College of Dental Surgery in 1890. During the many years of my early practice, and for a few years after I had started in Chicago, whatever the method employed for the regulation of the teeth, the main retainers were black rubber plates with nicely fitted interproximate extensions and often with German silver spurs and wire labial bows vulcanized into the plates to exert special retaining forces.

During the first year of my practice in Chicago, there fell into my hands four notable cases of dento-facial malocclusion, consisting of three pronounced

cases of upper retrusion, and one upper protrusion. Out of the demands in these cases, arose the practical disto-mesial application of the intermaxillary force, and the bodily movement of teeth. One of these cases in a supposedly finished state, was described in a paper read before the Chicago Dental Society, February 2, 1893. It was illustrated with plaster dental and facial casts, and with appliances, all of which were published in the following March number of the Dental Review. (See Fig. 1.) The other three cases in a more or less finished state were described in connection with this first case in a paper read before the International (Columbian) Dental Congress the following August (1893). They were illustrated with plaster dental and facial casts mounted in black velvet lined cases. Figs. 1, 2, 3, and 4, which will be referred to later, were published in the proceedings of the International Dental Congress of 1893, and in the Dental Cosmos.

In the rush to get these cases finished before the meeting, I was obliged to present two of them (Figs. 2 and 4) before the teeth were fully in place.

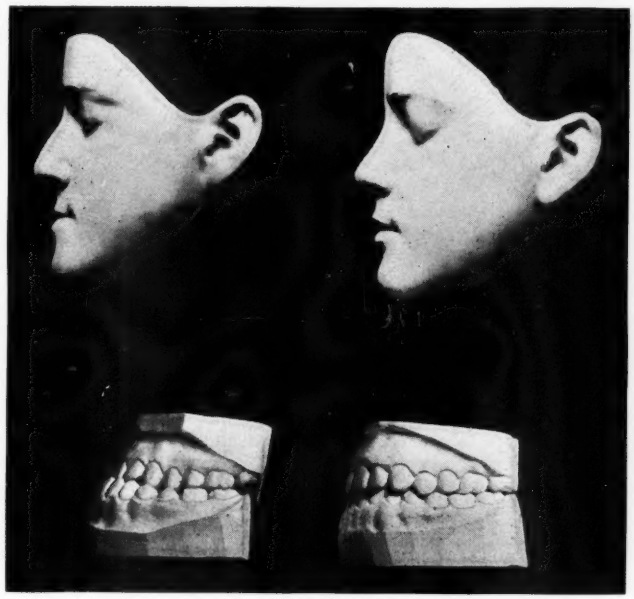

Fig. 2.

The Class III malocclusion shown in Fig. 1, represents the plaster casts of a girl thirteen years of age at the beginning of the operation in 1892. The dento-facial malocclusion was caused partly by heredity, but mostly by adenoids and long-continued habit of mouth breathing in early childhood years, resulting in a contracted maxilla and open-bite malocclusion. The treatment consisted in an expansion of the upper arch, a bodily labial movement of the upper front teeth, and a protrusive movement of the entire upper denture (the latter produced without my realizing it) through the reaction of the intermaxillary force which at the time was intended only as an auxiliary to a lingual movement of the lower front teeth, and for stabilizing the upper single-band anchorages. I speak of this here as a matter of history to show that I did not realize before its application in this case, the forceful influences of the intermaxillary elastics toward a disto-mesial movement of entire dentures. In cases which immediately

followed this, however, its mesio-distal action was planned for at the start and taken too much advantage of, which I found to my sorrow later, because it showed me the danger to permanency of retention by extensive disto-mesial movements with this form of force. Subsequently, I pointed this out in my early writings as a warning to other orthodontists whom I feared were overworking this method as I had done. It is that same danger of the overemployment of the intermaxillary force which I now again wish to warn you against in its relation to the subject of permanency of retention.

The second case, a Class III malocclusion also shown in Fig. 2, from the models of a girl fourteen years of age, was caused wholly by heredity. Her father and her brother were both afflicted with the same character of dento-facial malocclusion. The treatment, besides the bodily labial movement of the upper front teeth, consisted in disto-mesially shifting the dentures with the intermax-

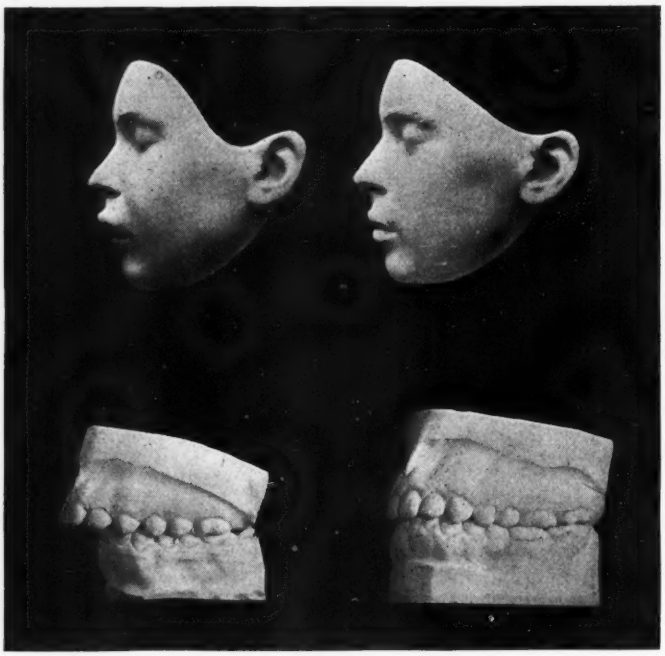

Fig. 3.

illary force toward a normal occlusion. As I said before, this case was not fully corrected when shown at the meeting and as published in the proceedings. The figure illustrates the final position of the dentures several months later when a normal occlusion was fully established. Then commenced the fight for permanency of retention, as in the other case, but which I am now sure would not have been possible, regulated in that way.

The third case a Class II malocclusion shown in Fig. 3, from the models of a girl about thirteen years of age, was also due to heredity, evidenced by other members and relatives of the family, though perhaps enhanced over the labial area by the thumb-sucking habit. The treatment in this case consisted in opening the bite by an extrusive movement of the buccal teeth. This enabled a retrusive movement of the upper front teeth and ultimately the entire upper denture mainly with the intermaxillary force, and—what goes without saying—it

also produced a protrusive movement of the entire lower denture. When I had succeeded in closing the wide interproximate spaces between the upper teeth, I found that the facial outlines were so improved, I concluded to present this case in this condition at the Congress with the others; a thing I had not expected to do, because I regarded it as only about half finished at that time; my intention being to place the teeth ultimately in normal occlusion. The facial casts here shown are the same as those published with the Congress paper. The impressions for the final dental casts with the teeth in normal occlusion were taken about one year later. Unfortunately, I did not take a final facial impression.

I had learned by this time (1893 and 1894) that it was a very easy matter to shift dentures to a normal occlusion with the intermaxillary force. As I said before, I also learned some years later that this is a dangerous expedient in nearly all cases where an extensive disto-mesial movement is demanded. First, because of the improbability of permanency of retention, and second, because

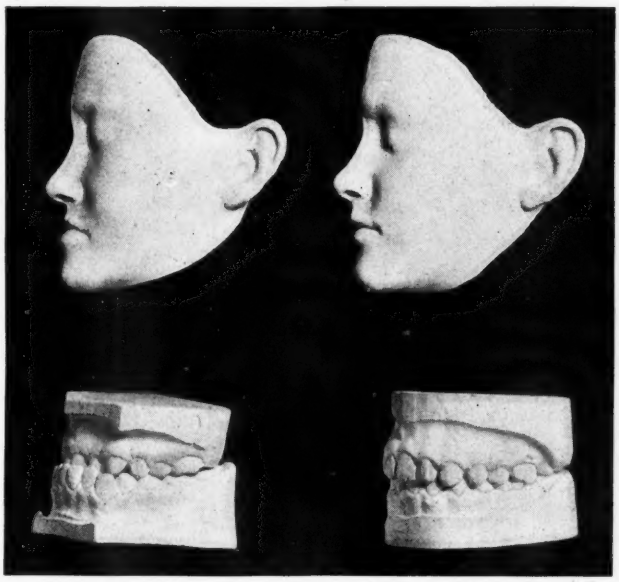

Fig. 4.

in a large proportion of these cases the best facial results cannot be obtained in that way.

I have brought these three cases to your attention to give evidence that in every one of them, and in a number of similar cases that followed, I was unable to finally retain the dentures and the facial outlines in their corrected positions.

The fourth case, that of a girl thirteen years of age, shown in Fig. 4, was a Class I malocclusion. The retruded malposition of the upper incisors was due to a local cause, and when corrected with a bodily labial movement, it was easily retained, because no disto-mesial movement of the buccal teeth was required.

The reason for the many failures in permanency of retention in my early practice was partly due to the fact that we had no reliable system of retention at that time, and especially no appliances adapted for the retention of

bodily movements. The principles, importance, and difficulties of retention were in their infancy in orthodontia. And yet, though lacking as we all did in all those days, in a full appreciation of the importance and difficulties of retention, I had been employing for years everything that an ingenious mechanical mind could suggest in the form of retaining plates and appliances, but nearly always in futile attempts to retain the teeth in cases that were corrected by an extensive disto-mesial shifting of the dentures to normal occlusion, and with no chance for the retention of bodily movements.

After six or seven years of discouraging experiences in attempts to retain the corrected positions of all pronounced disto-mesial malrelations of the dentures, which arose from heredity, I gradually developed and adopted my present system of retention, and also stopped all extensive disto-mesial movements of the buccal teeth to correct upper retrusions and upper protrusions, except in the comparatively few cases whose peculiar conditions

Fig. 5.

demanded the other treatment. But unfortunately, I did not adopt this method at that time in the correction of lower retrusions. I was, however, coming to the conclusion which I hold today, that all inherited, and even long acquired disto-mesial malinterdigitations of the masticating cusps present conditions that should be disturbed with great caution, if at all, except to adjust the occlusion, and especially with no extensive distal movement of the buccal teeth, upper or lower, except in those cases in which the first permanent molars have drifted forward through premature loss of deciduous teeth, or from other local causes.

Since that time, all extensive retrusions of the upper denture in Class III malocclusions which arise from heredity, have been corrected in my practice—not by moving the entire upper denture forward—but by a bodily labial movement of the front teeth only, thus opening spaces in the bicuspid

area for the insertion of artificial retaining teeth. (See Fig. 5.) In these cases, if the lower dentures are protruded, they are corrected through extracting the first bicuspids preferably, except when the second bicuspids or first molars are badly decayed.

In accord with these same principles in the correction of all inherited upper protrusions of Class II, in which the lower dentures are in normal dento-facial relations, I have for years in my practice extracted the first upper bicuspids preferably, followed as shown in Fig. 6, with a retrusive movement of the six upper front teeth, which commonly is about the only movement to speak of that is required; the buccal teeth frequently being already in an inherited or established malinterdigitating occlusion, and quite as useful for masticating purposes as a normal occlusion. I adopted these principles in my practice, because I found they enabled me to give to my patients good masticating occlusions, a correction of deformed facial outlines, and a permanency of retention which I could not obtain in any other way.

Previous to this change in my practice, in nearly all cases of Class II in which there was a pronounced protrusion of the upper with the lower normal,

Fig. 6.

there was an endeavor to place and retain the teeth in normal occlusion with the intermaxillary force, as shown in Fig. 3, but frequently with a most unsatisfactory dento-facial result, because the upper was only partially corrected, and the lower was abnormally protruded to the same extent or more, leaving the patient with a prominent mouth, indicating a partial bimaxillary protrusion, and what was worse, impermanency of retention.

There is another division of Class II malocclusion which is quite as distinctive and perhaps more common than upper protrusions, and though having the same general occlusal malrelations of the dentures, it decidedly differs from it in facial outlines and demands of treatment. The extreme type of this division as shown in Fig. 7 is characterized by a pronounced retrusive malposition of the entire lower denture in relation to the mandible and to a normally posed or nearly normally posed upper denture, and commonly it is associated with a closebite malocclusion. Facially, it is usually characterized by a decided retrusive deepening of the labio-mental area in relation to the chin and a normal or nearly normal position of the upper lip.

Between the two extremes of upper protrusion and lower retrusion of Class II, lies every gradation of dento-facial relation within the class, the composite of which is a moderate upper protrusion in connection with a moderate lower retrusion.

I am particular to fully outline this character—which no doubt is familiar to you—because it has always been, except in recent years in my practice, the *bete noire* of all my efforts in permanency of retention; and I thought possibly it might have been the same with you. With me, the main reason for this lengthy series of failures in this malocclusion, was because I was loath to admit that this particular character could not be permanently corrected through the normal occlusion route as shown in Fig. 8 until one ultimate failure after another continued to stare me in the face. In other words, I treated it along the same lines which characterized my very early practice in correcting upper retrusions, believing that pronounced lower retrusions also required an extensive protrusive movement of the entire lower denture—of course, with a bodily labial movement of the front teeth. Then commenced the usual unsatisfactory endeavor to retain the disto-mesial relations with a moderate continuation of the intermaxillary elastics. But

Fig. 7.

always or nearly always, with the same ultimate heart-rending result of seeing one case after another return to its former malocclusion and facial imperfection, after the retaining appliances were removed.

The illustrations here shown, represent only a very few of the many cases with this special character of malocclusion, which were corrected in my earlier practice by placing the dentures in normal occlusion. Nearly all cases of this character that were corrected in this manner, and for which treatment commenced in a number of instances at eight and ten years of age, I regret to say, have drifted back to their former malpositions; though for years I continued a moderate application of the intermaxillary elastics.

At least, about five or six years ago, I fortunately had the sense to adopt the same principles of treatment in the correction of lower retrusions as that which for years had enabled me to permanently correct upper retrusions. In this proposed method of treatment there is no attempt to extensively change the disto-mesial relations of the buccal occlusion, except to correctly adjust the linguo-buccal and disto-mesial interdigitation of the cusps. The main treatment consists briefly, in a bodily labial movement of the lower incisors, carrying forward

the cuspids and first bicuspids, partly through the reaction of the fulcrum arch bow, thus opening spaces for the insertion of artifical retaining bridge teeth, between the bicuspids. The separation of the bicuspids, or of any teeth for the insertion of artifical teeth, or the closing of spaces where teeth have been extracted, is always accomplished in my practice with bodily movements, enabled through the advantages of rootwise extensions—fully published in other places.

The retention of the bodily labial movements of the incisors, and the inclination or the bodily movements of the cuspids are secured with the usual six band retainers supporting the lingual iridio-platinum springs bars: A description of this is also fully published. When this appliance is finally removed after being worn about two years, the teeth are prevented from returning to their former malposition because of the sustaining force of the bridge dentures. This method results in an equally artistic correction of

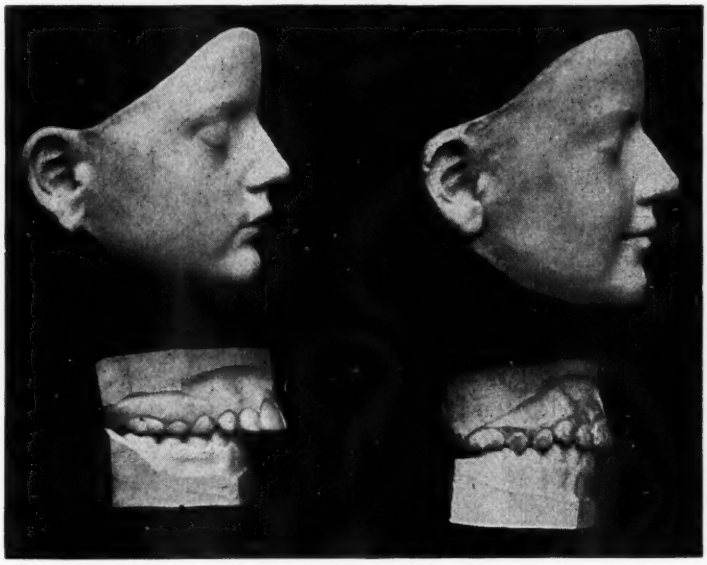

Fig. 8.

the facial outlines, and insures permanency of retention without materially changing the inherited occlusion of the buccal teeth.

Two cases of twin brothers commenced at twelve years of age, I will now show to illustrate this principle. These cases were practically exactly alike, being typical retrusions of the lower dentures in relation to the mandible, with closebite malocclusions: therefore, they presented a most favorable opportunity to test the comparative value of the two methods of correction. That shown in Fig. 9 was corrected by shifting the dentures as formerly practiced in these cases, to a normal occlusion with the intermaxillary force, being careful to produce a much greater mesial movement of the lower than a distal movement of the upper. That shown in Fig. 10 was corrected, as shown, by a bodily labial movement of the six lower front teeth; the first bicuspids being carried forward by the force of the fulcrum bow of the apparatus, and through the advantage of rootwise attachments on the bicuspids.

Now that these spaces are permanently secured in this case with extra bridge bicuspids there can be no doubt of permanency of retention. Whereas in the other cases, like many others corrected in the some manner, permanency of retention cannot be assured.

It is not usually a difficult operation to shift disto-mesial malocclusions of Class II—in protrusions of the upper and retrusions of the lower—to a normal occlusion with the intermaxillary force, providing there are no pronounced complications, and particularly in those cases where an evenly disposed reciprocal force may be employed as often arises. Neither is it beyond the reach of most orthodontists to obtain beautiful results at the close of operations in this particular type, by this method, even where considerable complications arise. But that is not the whole question which should be considered in the advance practice of orthodontia of today. Many

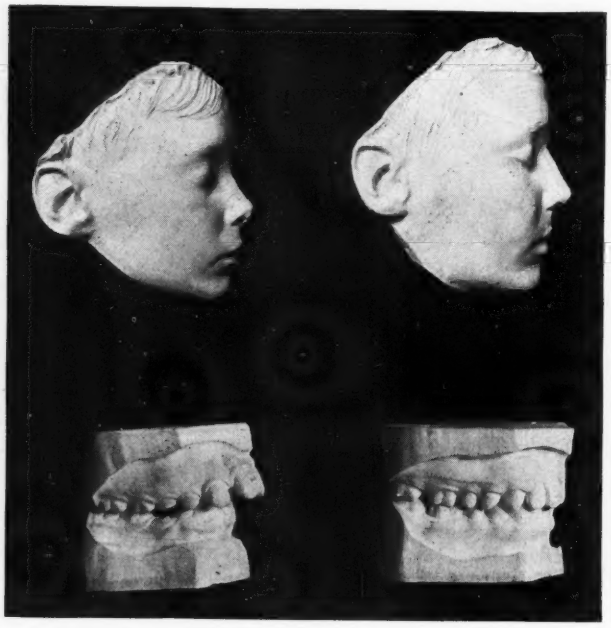

Fig. 9.

of these cases in my practice, and I daresay hundreds of similar cases in the practice of this specialty, have not retained the perfect positions shown by the finished results, even after being artificially retained for two years or more with the most approved retaining appliances. Why? Because the entire upper and the entire lower dentures have been moved backward and forward of their inherited positions in the jaws, and particularly because there are no stationary means of anchorage by which they can be reliably held in the corrected position until nature can establish their permanency of retention which I doubt would ever be possible.

I believe that a very large proportion of the failures in retention among the orthodontists of today is not due to the inadequacy of the retaining appliances they have employed, as much as it is to the radical application of the system which demands that all regulated cases must be placed in normal

occlusion. This must frequently place the teeth in relative dento-facial positions which no kind of appliances or plates that ever have been, or ever will be invented, will prevent them from returning partially or wholly to their former malpositions, after the artificial restraint is removed.

Before leaving this subject, I must beg your indulgence for a few moments in a little wider consideration of the radical formula that "in all cases the dentures should be placed in normal occlusion without the loss of a single tooth or its substitute." I believe that the day is not far distant when that teaching and its invariable application will be regarded as one of the great retarding forces of orthodontia, and in its place will come a rational scientific common sense orthodontia, stripped of all impractical imperialistic idealisms.

I believe that this formula and its impossible assertions in regard to its correction of the facial outlines, has been in the past, and is today overworked by hundreds of good men in orthodontia to their own detriment and the detriment of their patients.

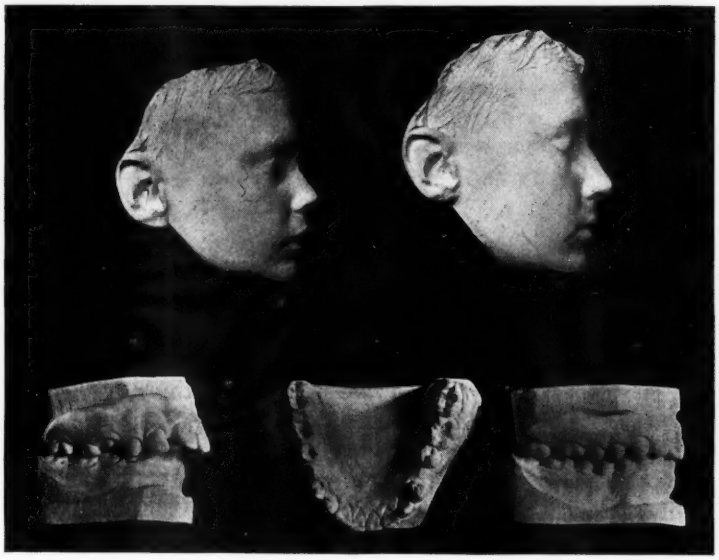

Fig. 10.

As one of the many illustrations of this that has fallen under my observation, a family of very moderate means consulted an orthodontist of high reputation, of conscientious ability, and a friend of mine, in regard to the correction of their son's teeth, who at that time was 12 years of age. The prominent feature of the case was deforming maleruption of the upper cuspids, in a mouth which distinctly indicated an inherited upper protrusion, shown by the mesial malocclusion of the upper buccal teeth in connection with a normally posed chin and lower lip, and proven by a similar malocclusion in one of the parents. The straining force of the upper lip—after a premature loss of deciduous teeth—had caused the incisors to drift back and nearly close the spaces for the normal eruption of the unusually large prominent cuspids. One of the complications of the case was a decayed and broken down condition of the right lower first molar, in which the pulp had

long since died and was in putrescent condition, and had previously given trouble from symptoms of an abscess.

I was told that the treatment outlined by the said orthodontist was to place the dentures in normal occlusion and restore the molar with a crown. I think you will agree with me that this is the same principle of treatment that has been strictly followed in the past by many orthodontists, and I believe it unfortunately is still followed by many who earnestly believe it to be the true principle in the correction of all malocclusions.

The case fell into my hands because of the prohibitive fee of the said orthodontist; this led the father to inquire if it could be corrected at the college. It is needless to say that the extraction of the two upper first bicuspids was ordered by me. This gave very little more room than necessary for the eruption and alignment of the cuspids. The diseased lower molar was also extracted, as in my opinion, no capable dentist in these days would attempt to save it.

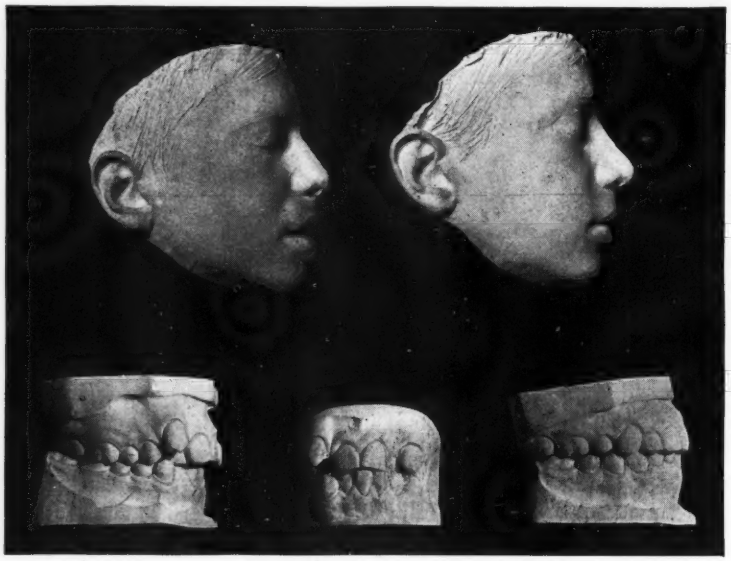

Fig. 11.

With the exception of appliances for the bodily mesial movement of the second molar to take the place of the extracted first molar, the case no doubt would have corrected itself without any regulating appliances, if given time under ordinary circumstances. It was hastened with an upper apparatus having a light resilient arch bow for the alignment of the cuspids, and with the intermaxillary force to aid in the mesial movement of the molar, and adjust the occlusion.

Fig. 11 shows the facial and dental models of the case at the beginning and completion of the operation. One can see by a careful study of the facial outlines at the beginning, that the lower denture was not retruded dentofacially, and therefore, had the upper cuspids erupted in alignment it would have been purely an upper protrusion. Consequently, to say nothing of the diseased lower molar, the only way that the facial outlines could have been corrected would have been by a retrusive movement of nearly the entire

upper denture fully the width of a bicuspid. But what would have been done probably, as in many similar cases, both dentures would have been moved disto-mesially, possibly with more of a protrusive movement of the lower denture than a retrusive movement of the upper, inevitably resulting in a partial bimaxillary protrusion of the upper and lower labial area.

Fig. 12 shows the case from the occlusal aspect.

The whole subject of orthodontia in its relation to the treatment of those pronounced dento-facial protrusions and retrusions of Classes II and III— to say nothing of the deforming bimaxillary protrusions in Class I— resolves itself, it seems to me, into the question: Which is the higher professional attainment for our patients and ourselves, to produce for them in the regulation of these cases, an absolutely normal occlusion of the dentures with the improbability of permanency of retention, and the possibility of an ultimate deforming dento-facial imperfection; or, on the other hand, to produce an occlusion of the dentures which fulfillls all the requirements of healthful

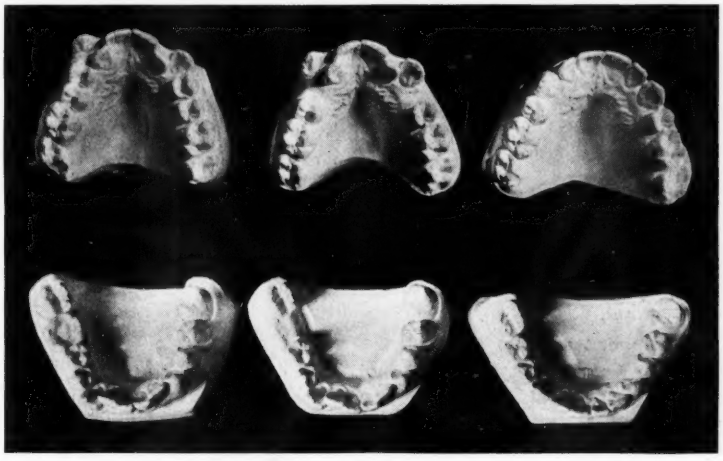

Fig. 12.

mastication, and results in a correction of the dento-facial disharmony; with a permanency of retention, which cannot be equally assured in any other way.

Finally, I hope that no unthinking mind will misconstrue the objective principles of this paper, or imagine for a moment that it refers to any dental irregularity, however jumbled or malposed, which can be perfectly and permanently corrected without extraction. Because it has reference only to a comparatively small part of the malocclusions which arise in practice, but whose correction and permanency of retention are of the greatest importance, because they produce the greatest dento-facial imperfections and deformities which the orthodontist is called upon to correct.

Furthermore, I do not wish to be understood as assuming that I follow the outlines of this treatment in every case, or that I invariably secure permanency of retention with my very best efforts, so much depends upon the forceful influences of heredity and a perfect cooperation on the part of the patient.

In the short time allotted to a paper it is impossible for me to even touch upon many coordinate subjects in causes, diagnosis, and technics, which I fully realize are of the very greatest importance to a successful application of the principles I have outlined.

In giving you this brief synopsis of many years of clinical experience in the treatment of certain dento-facial malocclusions which I have found the most difficult to permanently retain, it is hoped that the practical application of these principles will be of the same benefit to others as it has been to me.

DISCUSSION

Dr. F. M. Castro, Cleveland, Ohio.—The essayist has well said that the retention of regulated teeth is indispensable to the successful practice of orthodontia.

There are many factors that enter into the question of retention, some of which are, diagnosis and treatment, age, function, harmony in size of the arches, occlusal relations, interproximal contact, etc.

When a case presents itself to the orthodontist, a thorough, careful, and sane diagnosis should be made, anticipating in so far as possible the ultimate permanent retention. The diagnosis should consist in accumulating all data that is pertinent to the case, of a just and fair consideration of the same, and a decision made in accordance with good common sense and from a practical and operative standpoint. Ideals must never be made subservient to methods, or procedure, detrimental to the best interests of the case, but empiricism should be frowned upon.

The treatment should be consistent with the requirements of the case, no more or no less. Overtreatment should be religiously avoided. The reasons are obvious. The kind or types of appliance to be used are only incidental, provided correct principles are embodied within them, and they are properly managed, otherwise the final or permanent retention becomes a serious question.

Dr. Rogers has been able to successfully correct and retain certain types of malocclusion without the use of any appliance. When this can be done, it is much to be desired.

The adjustment and operation of the appliances is important and significant. Great care should be exercised not to injure the peridental tissues, or to produce and maintain traumatic occlusion over a long period. The physiologic processes should not be disturbed by the careless or unscientific application of force. It is my personal opinion that the majority of failures in retention can be attributed to faulty diagnosis and treatment.

Diagnosis, treatment, prognosis, and retention are convered almost entirely by the age at which orthodontic interference begins.

The question of extraction is practically never considered if the orthodontic operation is begun early enough. The establishment of occlusion relations and the permanent retention becomes comparatively very much simplified in such cases.

The function of the mouth and teeth should be kept to its highest degree of efficiency during the entire operative and retentive period. The mouth and teeth should be kept clean and healthy. These are fundamental principles without which the greatest success cannot be attained either in treatment or retention. Any appliance or treatment that interferes with this plan must be absolutely avoided. In this connection I wish to state that a retaining appliance should allow of mobility of the teeth, should consist of as few bands as possible, and should be of the removable or semi-removable type in all cases where indicated or where possible to be used.

The bands should be removed occasionally and left off for a few days in order to give the teeth a chance to breathe and to adjust themselves more or less to existing conditions. The question has never been satisfactorily settled as to whether or not the enamel of the teeth is rendered more susceptible to the attack of microorganisms when bands have been worn for a long period, during which time the teeth have been deprived of their natural environment.

Some authorities claim that the enamel can only be kept in a normal state of health and resistance by being bathed in saliva, arguing that since it is a normal physiologic condition it must, therefore, be a beneficial one. I think incidents have been called to the attention of most of us where the resistance or vitality of the enamel was apparently lowered after the removal of bands and appliances that had been worn a considerable time. Research and clinical observation of this problem would be most appropriate and beneficial.

The ultimate success of retention, whether controlled by natural or mechanical forces, will depend finally, upon the establishment and maintenance of function.

The fact that harmony in the relative size of the arches must be established as a principle of retention is not debatable, neither is its necessity unknown to any of you. However, the manner in which this may be done is debatable and has a most decided bearing upon the retention of certain cases of malocclusion, some of which has been pointed out by the essayist.

There are certain fundamental principles in orthodontic practice upon which we can all agree:

First: To remove the cause or causes when possible.

Second: To render only such orthodontic service as is necessary for the correction of a given case.

Third: To move as few teeth as will bring about the desired result.

Fourth: To influence teeth to erupt into correct positions rather than move them into such positions after eruption.

We also know that occlusal relations established by natural forces and maintained for several years although abnormal mesio-distally, will always be retained as such.

These principles are pertinent to the question of retention and are concerned in the treatment and retention of certain cases presented by the essayist.

With these things in mind then, the question naturally arises, whether or not, considered both from the standpoint of treatment and retention, it is ever advisable or permissible to extract permanent teeth in the correction of malocclusions. Pardon me, but I do not, at this time, intend to discuss this momentous question. However, I do wish to call your attention to the fact, that Dr. Case has demonstrated by the presentation of several cases that his diagnosis and treatment was based upon sound judgment.

It is needless to remind you of the great importance and of the utter dependence of retention of the teeth upon the occlusal relations. It matters not by what man or method, or whether by witchcraft or science, the case be treated, if certain definite incline occlusal relations are not established, the case will be doomed to failure. Mechanical retention will avail nothing.

The conservation of approximal contact is also necessary to the final retention. Loss of contact or abnormal contact will render the adjacent peridental tissues susceptible to disease because of injuries to them from the excursions of food in the act of mastication and from the further fact that severe traumatic occlusion may be produced by food packing between the teeth. If this occurs, and is not corrected, the retention, in fact the entire orthodontic operation, will ultimately be a failure.

I do not wish to discuss the question of heredity as related to the problem of retention, except to say that in the light of present knowledge I do not believe it has very much influence. I do not think that any particular type or class of malocclusion is due to heredity any more than are other physical abnormalities, such as, for instance, club-feet, or bowlegs, but I am almost convinced that practically all cases of malocclusion occur after fecundation or fertilization of the cells, and are the victims of circumstances during development, which includes the congenital as well as the preadolescent period, the perversions being due principally to function and environment.

I have purposely avoided the discussion of appliances and technic, because, as I said before, they are, to my mind, only incidental when compared to the real fundamental principles of retention.

Dr. Case has presented many things that give us food for thought. He has very kindly come here and given us of his valuable time and knowledge, and I wish to take this opportunity to personally thank him. I also wish to thank him for sending me a copy of his paper several weeks ago.

Dr. C. A. Hawley, Washington, D. C.—To many of the things Dr. Case has said in his introduction in regard to the necessity of permanent retention I can heartily agree. To the intimation or presumption which is carried through the first part of the paper, that the work of a large number of the leading orthodontists of the country is failing because of the failure of their retention, I most emphatically protest.

He quotes the opinion of a "prominent New York Orthodontist" in support of this implication that much of the work of orthodontists is a partial failure, yet neglects to quote the authority on which this statement is made. It seems to me that if this statement is to have any weight at all the name of the author should be made known. It places every prominent orthodontist in New York under the suspicion that he considers his retention a failure, and we do not know whether it was a chance remark in regard to some feature of his own practice or the serious statement that is implied.

Considerable has been written in the last few years about retention—about the difficulty of retaining details of the treatment—as for instance, the exact overbite, the exact width of the arches, the rotation of certain teeth, etc.; but nowhere have I seen an intimation of any considerable failure in retaining the main, important features of the treatment and nowhere have I seen any references to failure in retaining the mesio-distal relation. I have, since receiving this paper, asked a number of prominent orthodontists, whether they were having any especial difficulty in retaining the mesio-distal relation and they all replied "No."

Does the failure to retain all the details of many cases mean that the work of orthodontia is a failure? I do not think so. In fact, I believe that the majority of orthodontists have been able to correct and retain the main, important features of their treatment and that their work is a success. I do not believe that the practice of any branch of dentistry or surgery has so large a percentage of satisfied patients, and the universal success of the majority of orthodontists in the country all testify to the success of orthodontia.

Dr. Case has for twenty-five years recommended and practiced the extraction of teeth in a certain number of Class II and Class III cases, or cases where the mesio-distal relation of the teeth has not been normal. What has been called by Dr. Case and others, "the New School of Orthodontia" has protested against this practice as unnecessary. Dr. Case seems to think he sees in the recent discussions of retention, and in the opinion he has quoted, signs of failure in retention of the mesio--distal relation, and advises that the whole trouble is in the treatment. In this I believe he is entirely mistaken. The failures in retention as quoted, do not refer to these classes of cases more than any others, and in the instances where it does the trouble is becoming more clearly understood and it does not, so far as I can see, relate to the manner of treatment. I think we are finding some reasons why the retention fails and some of these have been previously pointed out.

I believe the teaching of extraction leads to great harm in the hands of inexperienced men. For example, if you will pardon personal reference, I will say that I heard one of Dr. Case's first papers twenty-five years ago and was much impressed by it. It was shortly after I graduated (ten years before I took up the study of Orthodontia seriously) and I went home and attempted to treat a case in that way. I find that I still have photographs of the face masks (Figure A). This treatment was a mistake and not an example of what Dr. Case would call a correct application of his principles, but a mistake young men frequently make in trying to follow the teaching of extraction. This appearance of the obtuse angle between the nose and upper lip has been with me like a nightmare ever since, and has checked any desire to adopt this plan of treatment unless I could be sure of the results.

During all the seventeen years of my practice of Orthodontia, I have watched for cases in which I could be certain that I could extract teeth as Dr. Case recommends and be sure of getting a more desirable result than I could by retaining all of them; and I have never yet found one. Perhaps I could not distinguish them, but I never have since that time extracted teeth in such cases.

I have taken a great many face masks, but have long ago abandoned them, because I do not believe they tell the whole story. They do not give the same correct view of the form of the head and expression of the face that is obtained by photographs.

As to the matter of inheritance, Dr. Case is positive in his statements that he treats in this way only those cases that are inherited, and he is very sure that he can tell an inherited case.

So far as his treatment is concerned, it has been my experience that there has been no more difficulty in treating cases in which the father and mother had the same deformity than it is in a case that they did not, and it is rare to see this deformity in both.

Dr. Casto.—Do you call that case inherited or not?

Dr. Hawley.—At that time, I could not tell, and I cannot now. I will say that in the opinion of scientists an abnormality cannot be inherited through one generation. I have looked upon it in this way, that in case we did find the same abnormality, the same disto-occlusion in the child (as in the father and mother), the environment was the same and the conditions were the same that produced the malocclusion, but not that it was inherited, or that that fact was any obstacle to its treatment. It seems to me, if we consider the question of inheritance, we must also consider the fact that, as Dr. Gregory says, for twenty millions of years mammals have inherited normal occlusion; and would there not be more likely a tendency to maintain the normal occlusion than abnormal occlusion? It seems to me that is a far stronger argument.

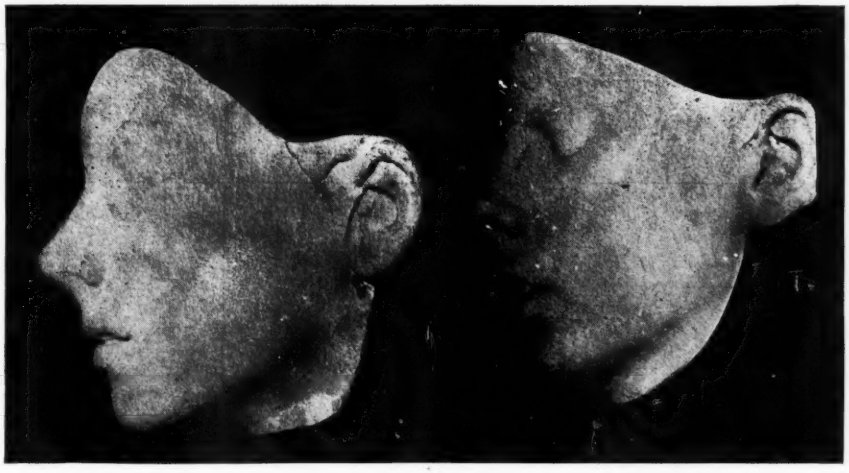

Fig. A.

Coming down to a later time, we will say for ten thousand years, the normal human being has had a normal mesio-distal relation; and is it not just as reasonable that inheritance would tend strongly in that way, instead of, as claimed, that in one generation from father to the child, you could have an abnormality handed down that is going to persist?

Dr. Case states that we had better come to the conclusion that distal occlusion is for all practical purposes as good as normal occlusion. Is it? In a normal occlusion the strong lingual cusp of the upper molar works in the middle of the sulcus of the lower first molar, as a pestle in a mortar. There is great strength of mastication in this normal occlusion; in distal occlusion the strongest cusp works between the two teeth. If there is some reason why through all these thousands of years normal occlusion has been inherited, is it not because normal occlusion is more efficient for mastication?

In the cases where I have had difficulty in maintaining the mesio-distal relation, it has been my tendency to seek the cause, and many times I have found it and it can be readily pointed out.

I have one case that I brought with me that I can use for illustration. I brought it to show primarily that it is a partial failure after three years retention after appliances were all removed, and to show the reason why.

This child was about twelve years of age, was treated for about two years and a half, retention was used for two years, and the mesio-distal relation seemed to be well established;

then the girl went away. She left town for a boarding school and was gone for three or four years. She is now twenty years of age, and came back a few weeks ago with this condition (Fig. B). You see the mesio-distal relation is not being perfectly retained. Neither the father nor the mother of this girl has disto-occlusion, so it could not be inherited.

When I took models and made a careful examination, I found the canines and the first premolars had contracted about one-sixteenth of an inch, so that it was impossible for the mandible to close forward in proper position. I put on a lingual appliance with little finger springs, and in about three weeks opened the arch in this region, and without intermaxillaries at all, it simply moved back to a normal mesio-distal relation. Upon taking radiographs of the upper third molars I found them both impacted. It seems to me that possibly this is a cause for this failure, and I am not discouraged in this case at all, as I fully believe that with a removable retention and with the removal of the impacted molars, I will be able to retain the case permanently.

I show this case because I believe it illustrates the reason why many Class II cases tend to return. Obviously as long as the arches are kept in the normal relative sizes the patient cannot bite in distal position. The teeth will not occlude in that position; but a fixed retainer is used and generally it is removed too soon. The upper arch commences to contract and the lower teeth seek a distal position to find a more comfortable occlusion.

It is largely a question of interference. A slight interference will throw a case into distal occlusion. I have had a thick ridged band on a lateral incisor or the tilting of a sec-

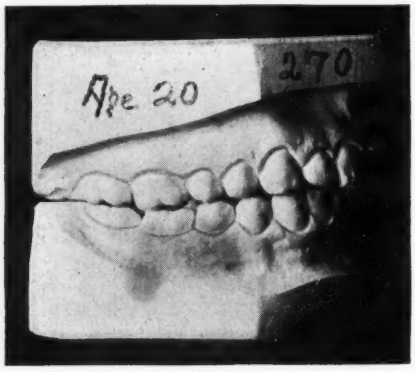

Fig. B.

ond molar throw a case into distal relation. If we carefully look for the cause in the cases that have relapsed, we will find some interfering cusp or other cause that has been overlooked.

Fig. C shows one of the faces before treatment and after. Dr. Case recomemnds extracting "all inherited and even long acquired disto-mesial malinterdigitations of the masticating cusps." This was a well-established distal relation. It seems to me that the extraction of the upper premolars would be likely to carry back the upper lip, and even with the retention of all teeth there should not be possibly attempted any recession of the upper lip. While possibly it takes longer, and I will admit many of these cases take longer and more persistent treatment, yet it seems to me worth while, and if it were my daughter I would take years and years rather than risk the extraction of the teeth.

As for Dr. Case's proposition to open spaces for a bridge tooth, in the light of the revelations concerning the life and stability of anchor teeth in bridge work, even though they be vital teeth, the evidence produced in examination of bridge work shows that in a short time the anchor teeth will be crippled by changes in the supporting tissues or devitalized.

Here is another set of models of a case I treated a number of years ago (Fig. E). Unfortunately, I have left the slide at home showing the mesio-distal relation, but this was a distoclusion case. This case was treated for I do not remember exactly how long, maybe two years, and then was retained with fixed retainers, and all the retainers had been off for over three years. The patient came back two or three weeks ago, and this was what happened. The

model on the right (Fig. F) shows the upper arches in their original position. The middle one is the relation in which I placed it, or as it was when I took off the retention, and the one to the extreme left is the condition in which it is now.

It is a type of failure to which I have previously called attention—not the relapse of the mesio-distal relation, because the mesio-distal relation has remained perfect. Even in the present state of this case, I do not feel that treatment is a failure by any means.

Fig. C.

Fig. D.

To go further, why might it be called a failure? In the first place, I provided a fixed retainer which was removed at a definite time, and neither I, nor any one else, could tell whether that was long enough. Then when I radiographed the third molars in this case I found them all impacted. It is my impression that it is the crowding of the eruption of these third molars that has been responsible for a partial relapse in retention, and I fully believe that with the removal of the third molars and with a little further treatment and a removable retention this case will be completely successful.

I am not going to quarrel with any one, least of all with Dr. Case, or say he has not the right view in some cases, the mature cases, which have reached the age of fifteen or six-

teen or more. He may find it expedient and better for him to extract premolars, maintaining the procedure he has described, and yet some of the cases in my own experience that have responded most readily to the correction of the mesio-distal relation have been some of these older cases. I have been astonished at it, but it is true. When the arches are widened and placed in their normal harmonious relation, there has been no great difficulty in maintaining and correcting the mesio-distal relation.

Where I quarrel with him decidedly is in his broad assumption that no one is succeeding in retaining Class II and Class III cases.

There is another part of the paper that is important. Dr. Case speaks of a form of retention which he has used for twenty-five years with uniform success, and he wonders why we have not all taken it up. I am not going to speak for anybody else; I am going to be frank and tell him why I have not taken it up. Dr. Case intimates in his paper that the reason this has not been universally taken up is because it is difficult of construction. I do not think that is true for one moment. I do not find that this is particularly difficult of construction, and we do dozens of things in Orthodontia that are far more difficult than the

Fig. E.

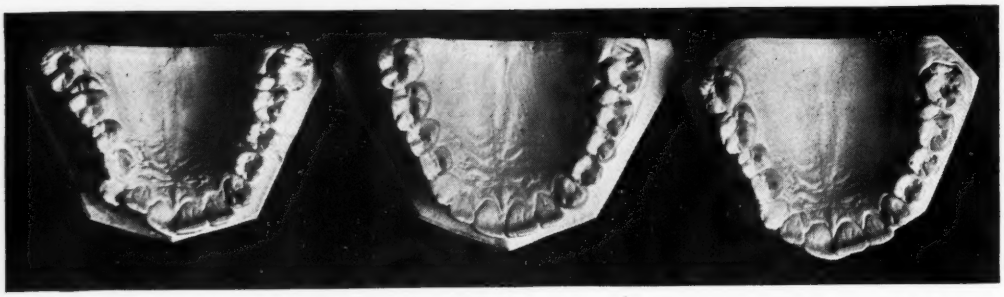

Fig. F.

construction of this retainer. I have seen several of these that Dr. Case has placed in the mouths of patients, and they are certainly made beautifully, and his technic is fine. I have made probably half a dozen of these retainers, and I thought I succeeded pretty well.

Now, the reason I do not like them is this: They will get out of order; the cement will wash out between the lingual surface of the retainers and the teeth, and this makes an element of danger. I have never had decay in these cases occur between the teeth, but I have heard of a great deal of trouble with decay of the teeth occurring where these little points went in between the teeth. But there are other greater objections to this retainer in my mind. It holds the teeth too rigidly. I do not believe that absolutely rigid retention of the teeth is the best thing for them. They must have more individual movement.

The other objection I have to the retainer is that it must be worn (with bands on the teeth) for a definite length of time. Dr. Case says generally two years, and then all removed and trust to luck for the results. No man can tell just the time when you can remove any fixed retainer, and I do not believe a great many of the cases will stay after being retained

with a rigid retainer such as this for two or even three eyars. For that reason, in my effort to correct some of these details of retention, I have used another type of retention with which you are all familiar. With the removable retainer, you can also hold the bodily movement of the six anterior teeth and, in fact, produce bodily movement with it; and is it not safer? There is no definite time when you take it off and say, "Well, we will trust to luck for the result." While the retainer of Dr. Case is perfectly satisfactory to him, it seems to me to have very vital objections.

The question of whether this removable retainer is efficient depends largely on this one question: Can you retain a rotated tooth with it?

Here is a case (Fig. G) that was treated in which there were rotated anterior teeth. There never was any retention upon this case except a removable retainer, and that has been retained for three years, and I have seen the patient four times in that time. Would I be safe

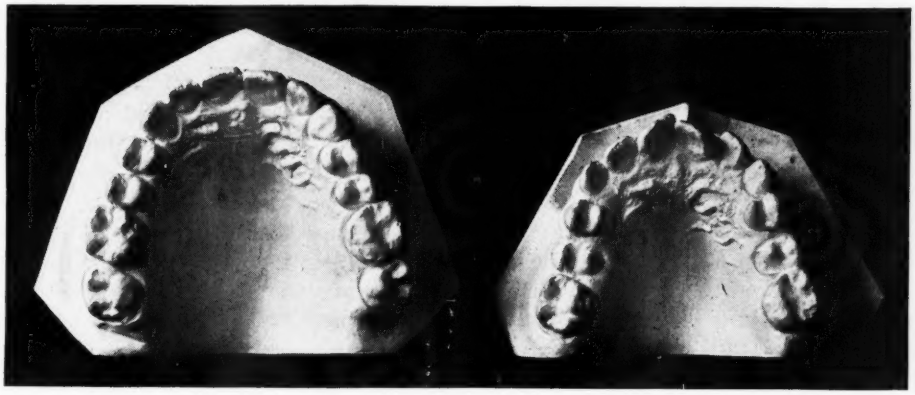

Fig. G.

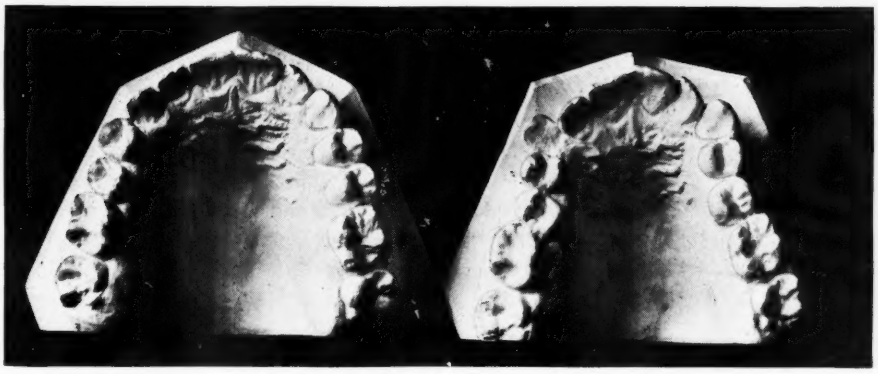

Fig. H.

if there had been cemented bands on the teeth in that time? Directions were given that I should see the patient oftener, but like many other patients, she did not come. There are no decayed teeth, and the rotation was maintained.

Here is another case (Fig. H) that never had a fixed retainer, but a removable retainer, and has been retained for a year and a half. I have seen this case more frequently. There was a period of six months when I did not see the case. It seems to me, that if rotation can be retained and bodily movement can be retained with a removable retainer, without the danger of decay of the teeth from a dozen bands, and without the danger of decay between the teeth, it is a much better procedure than to use such a complicated structure as the six band retainer.

Dr. Case, in closing his paper, states that this treatment which he has advocated here is only used in his practice in a small percentage of cases, yet, he pleads for a re-

vision of the methods of practice of other orthodontists because it has been stated and acknowledged that in cases *not confined to the small residue which he* has treated, absolutely ideal occlusion is not established. I want to say again that I believe, so far as I know from my communications with orthodontists, the majority of their cases of treatment of disto-occlusions or mesio-occlusions have been successful without the extraction of teeth.

Many cases give trouble; there is no question about that, but we are finding out more and more the reasons why. Many things can be improved and I believe will be improved, but I am sure that the majority of orthodontists have no tendency to turn in the direction of the method Dr. Case has described.

Dr. J. Lowe Young, New York City.—I think Dr. Case is familiar enough with the Society of Orthodontists to appreciate that when he comes before us to present a subject for discussion that the discussion is to be frank and open and that there is nothing personal in it; the object being the promotion of the Science of Orthodontia.

In my judgment, Dr. Case has been very consistent in what he has presented here today. He has outlined where he would open up spaces and put in extra teeth in certain few cases. He has, however, made a few statements which I think are not fair, and one statement in particular that I object to, is that lower teeth in disto-occlusion in relation to the upper are as efficient as when they are in normal occlusion. That this is not a fact can be easily proved by careful examinations from the lingual view of casts of such cases.

I would like to suggest to the essayist that when he prepares another paper using lantern slides showing plaster casts that he have pictures so made as to be readable. Those he has used for years have been so small it was absolutely impossible for any one to accurately follow his description of the cases in point. We have had to take the whole thing on faith.

I would not have the temerity, from what the essayist has shown on the screen today, to say he was wrong in many of these extractions because of the impossibility of judging the cases from such small pictures as referred to above. I believe, however, from the bottom of my heart, that in advocating the extraction of teeth he has done more harm to the cause of orthodontia than he has done good.

I do not mean by this that he has practiced wholesale extractions and to have done particular harm by that means, but he must realize that the dental profession for generations have been keen to remove teeth with the false idea that this simplifies treatment. I feel sure he realizes when he has extracted teeth he has not facilitated treatment. He has done it with an entirely different thought. He has done it because he has felt that in certain peculiar cases he would get a better facial or final result than if all the teeth remained in the mouth. It has not been a question of expediency, but the dental profession does not get this phase of it. They say "Dr. Case extracts teeth," therefore it encourages them to extract teeth and they do it in countless cases where I am perfectly satisfied the essayist would never think of resorting to such a method of procedure.

The case shown by Dr. Hawley I am sure substantiates this argument. It is very doubtful whether Dr. Case would advise the extraction in this case, but Dr. Hawley got the wrong viewpoint.

Two weeks ago a patient was referred to me by a dentist with a very simple Class I malocclusion. The space for the upper right canine was almost closed due to premature loss of the deciduous teeth. The dentist advised that the teeth be removed; stating that the removal of the first premolar, which had just erupted, would simplify treatment. This I absolutely refused to do for a child ten years of age, so they decided to take the other fellow's advice and have the tooth removed with the result that this child will limp through life with a mutilated set of teeth due to the dentist looking at things from the wrong angle. Now I know Dr. Case would not think of extracting in such a case.

Dr. Thomas L. Grisamore, Chicago.—I hesitate to take the time of the Society because I know you are behind with the program. However, I want to compliment the essayist upon this most excellent paper. It gives me great pleasure to inform this body of orthodontists, that what little success I have achieved in the practice of orthodontia, has been very largely due to the teaching and influence of Dr. Case.

When Dr. Case presents a subject to the dental profession, I know it is based on his practical experience, and the theories presented have been thoroughly tested in his own pri-

vate practice, and we can rest assured that in this way he obtains the best possible results. I have heard him teach for years, and he does not only teach what he believes and what he practices in his own office, but he teaches the things that other men practice and teach. Furthermore, he does not hesitate to adopt other men's methods in his private practice, if by so doing, there is a possibility of serving his patients to a better advantage.

About thirteen years ago, when I first became associated with Dr. Case in teaching, he said to me: "You will live to see the time, but I never will, when the orthodontists in this country will advocate and practice the bodily movement of teeth and the occasional extraction of a tooth during orthodontic treatment." Dr. Case, himself, has not only lived to see the orthodontists practice bodily movement of teeth, but to see a great many efforts put forth, trying to develop some simple appliance to produce this movement. He has also seen practiced, and heard papers read before this organization advising, the extraction of teeth for orthodontic purposes in certain classes of malocclusion.

Regarding what Dr. Hawley has said, I am afraid there are orthodontists in this country who believe that Dr. Case removes teeth, or inserts artificial teeth in every case in which there is a mesio-distal malocclusion. I firmly believe that if any of you would go to his office, and look over his cases for the past ten years, you would find the percentage of cases in which he has extracted or inserted artificial teeth, would not be greater than that of the majority of orthodontists who have been practicing for twenty years. He does not extract, neither does he insert artificial teeth in all these cases. He does not extract any more teeth than many other orthodontists, but he talks more about it and it appears as though he does. Dr. Case does not extract teeth except to a limited extent, and if you will read his papers carefully, you will find he says so.

The attitude of the dental profession, as well as the orthodontists all over the world toward Dr. Case, is sufficient answer to Dr. Young's remark regarding the influence of Dr. Case's life work. He teaches students that in a very large percentage of cases it is not necessary to extract teeth; he teaches them that in practically all cases they should put on appliances and try to produce normal occlusion before they resort to extraction. He teaches them to try to bring about normal occlusion, and if the dento-facial area is out of harmony with the immovable features of the face, then it is time to extract. You will also find that in cases where he has taken out teeth, there was a decided protrusion of the entire denture, and where he has inserted teeth, there was a decided retrusion of the entire denture, and in practically all of these cases the patients were older individuals, most of them between eighteen and thirty years of age.

He has practiced orthodontia much longer and treated many more cases of mature years than most of us. I am sure you would be surprised, if you should go through his records, to find the number of cases he has treated between twenty and thirty years of age. You will find these are the cases in which most of his extraction or insertion of artificial teeth have been done. This method is seldom resorted to in younger individuals.

Dr. Case (closing).—It seems to me, much of the discussion that has taken place has been quite foreign to the paper.

I am indebted to Dr. Casto for giving the general principles pertaining to retention, as I felt that I could give no more than a cursory review of principles which pertain strictly to my subject.

My paper pertained to a very small number of cases that we find in practice, i. e., extensive protrusion and extensive retrusion of the upper and lower dentures in Classes second and third, which arise from heredity.

I should like to have the time and ability to speak extemporaneously in regard to the question of the laws of heredity, and how I happened to know that this or that case is an inherited case, but there is not time, and in fact, it is something that requires a broad understanding of some of the principal laws of biology.

There is one point I want to mention in regard to Dr. Hawley's discussion. When a man illustrates a single case that he has corrected or attempted to correct himself, and it has proved a failure, and sets that case up as an example and argument against an extensive and successful practice of any man whose methods differ from his own, it seems to me very absurd, with all due respect to my dear friend, Dr. Hawley.

I can see how after extraction of the premolars, for instance, followed by a lingual inclination movement of the front teeth, that any one would produce exactly the same result he has shown. That is what I often do in the first retrusive movements of the six front teeth. I have case after case showing the difference between the proper bodily retrusive movements of the roots of these same teeth and their inclination retrusive movements. He has not moved the roots, and consequently he has left a protrusive condition at the upper apical area.

Dr. Case was asked to continue his discussion in writing, to be published with the proceedings.

Dr. Case's further remarks in writing: Since a careful reading of the stenographic report of the discussion of my paper, I am more than ever convinced that the real claims of my paper were not specifically discussed, notwithstanding the carefully prepared length of the discussion which wandered into many by-paths pertaining to the general practice of orthodontia, many of which I did not even touch; and in some particulars the discussers misquoted and misconstrued the reading of the paper itself, all with the view apparently, to destroy the force of my evidence which they seemed to fear would do harm to their established principles of practice.

Now I want it to be understood that I have no quarrel with these very good friends of mine who have always treated me with the greatest possible consideration, but I can now understand what Dr. Hawley meant when he has said to me on several occasions that the members of this society are very outspoken in the discussion of all papers; and I am pleased to find that this spirit has been so freely exercised on this occasion, because it gives me a chance to quite as freely express my thoughts in the same frank and friendly spirit in defence of the claims of the paper and much that was outside of the paper itself.

While I have always fully appreciated the wonders which the American Society of Orthodontists have accomplished in advancing the practice of orthodontia and its general employment, I have always believed, and now more especially after this discussion, that there is one unfortunate drawback which in my humble estimation seems to pervade this society and retard its development toward true scientific advancement, which is: that a number of its most influential members are so obsessed with the Angle radical teaching in regard to causes, extraction, and the normal occlusion formula, they cannot see that there is anything true outside of it, and I am especially surprised to find that they still swallow whole, Angle's fantastic creation teaching that all children when born are destined through inheritance to possess normal occlusions, which would always obtain, were it not for certain local causes, etc., etc. All of this I now emphatically assert, is contrary to the vital principles of biology which is taught in our schools, and regarded as one of the requirements of education. Judging from the arguments expressed by the discussers who tackled this part of the subject, it would seem that they do not think it of sufficient importance to even superficially inform themselves in regard to scientific principles and clinical evidence, which abundantly disproves the radical and absolutely silly assumptions.

The influence of these leaders is so strong and so arbitrarily kept before this society, its members hesitate to express opinions which they are plainly given to understand are contrary to the so-called basic principles of advanced orthodontia, but which they actually believe and practice; and moreover, what they have learned by experience they *must* practice if they arrive at results which they are beginning to appreciate and understand can only be fully accomplished in a rational practice of orthodontia. Even my friend, J. Lowe Young, who told me years ago that he believed that heredity was one of the principal causes of malocclusion, did not consider it politic—or something—to say one word in defence of heredity in his somewhat personal attack upon me and my advocacy of rational extraction which he must know is founded almost solely upon heredity as the cause of conditions which demand extraction.

This arbitrary imperialism of the leaders was shown in Dr. Hawley's remarks when he so scathingly condemns a man or men, who have the courage of their convictions to say, "they fear that orthodontia is more or less of a failure," after finding "that it is impossible to permanently retain a large proportion of their most important cases;"—probably the very kind of cases to which my paper referred, and which they had corrected by an extensive disto-mesial movement of the entire dentures to a normal occlusion. And he continued to

ring changes upon that very natural "*failure*" quotation of mine until he had twisted it into the assertion that I stated in my paper that "The modern practice of orthodontia as conducted by most men in the profession *is a failure,*" and "The implication is that the whole practice of orthodontia, except along the lines he (Dr. Case) indicated, is a failure." That certainly is a very liberal friendly garbling of my paper, which practically, in itself, referred to only three distinctive characters of malocclusion. I may be wrong, but it seemed to me this endeavor to place me in the wrong light before the jury at the outset of his discussion was not so much because of my quotation as it was to vitiate the real claims of my paper in daring to propose a remedy before this society for the obviation of these failures which did not regard a normal occlusion of the teeth as so essential to the patient as the correction of facial deformities and permanency of retention, though it left the patient with an occlusion which was sufficient for all the necessary purposes of mastication.

The particular characters of malocclusion to which my paper was specifically confined were *inherited pronounced upper protrusions and lower retrusions of Class II, and upper retrusions of Class III.* In the correction of all these characters whenever in my early practice I attempted to shift the entire dentures to a normal occlusion in connection with *bodily* linguo-labial movements of the front teeth, it was impossible for me to permanently retain them, and because of this and its very great importance, *I* also was fast coming to the conclusion, in those days, that orthodontia was so much of a failure I would have gone back to the general practice of dentistry had I not discovered the remedy. And now when I place it before this society in an honest endeavor to help others, who like myself—keep it as sly as you choose—are fast coming to the same conclusion, I find that the concensus of opinion among these few leading members at least, is that all my principles of practice are wrong in regard to causes, diagnosis, treatment, and retention. And I cannot help but believe that this is because the remedy I proposed for these special failures is contrary to the arbitrary teachings of Angleism. (Please understand that I use the term Angleism in an adjective sense, and with no desire to cast opprobrium upon Dr. Angle himself.)

All this part of the discussion was, of course, presented in a very friendly manner, and aroused no feeling in me except to give me a few moments of good-natured amusement; especially when my friend Young asserted that I have done more harm to the cause of orthodontia by my advocacy of rational extraction, than I have ever done good. Well, perhaps there are times when the truth should not be told. But not when it pertains to the alleviation of wrongs to many people, among which may be mentioned the unfortunate practice of stamping for life upon the physiognomies of our confiding patients, noticeable facial imperfections and deformities which lie within the province of orthodontia to permanently correct.

The incident which he portrays of the dentist who wrongfully advocated extraction, is not an uncommon one, and with results at times that are exceedingly harmful. But is that legitimate evidence that under all circumstances in orthodontia *no* teeth should ever be extracted? If so, then the thousands of disasters which are constantly arising from ignorance or the inexcusable acts of fools should be regarded as evidence that we should desist from the employment of many of the greatest benefits of life.

Among the three characters of malocclusion to which my paper specifically referred, there was only one for which I advocated extraction of teeth. This referred to inherited upper protrusion with the lower denture in normal dento-facial relations, and with the lower buccal teeth in full distal malinterdigitation. In following the theme of my paper, I explained that one of the main reasons I extracted teeth in these cases was to avoid an extensive disto-mesial movement of the entire dentures required by a normal occlusion, and because I had found after many years of experience that such extensive movements of the entire dentures in inherited cases could not be permanently retained. Not but that there are other characters of pronounced protrusions for which I extract teeth, but this was the only character which I specifically mentioned that demanded extraction; and consequently, it was the only one that should have been discussed in relation to extraction. But what was the result? Before we got through, it seemed that almost the entire discussion pertained to the general question of extraction, even to extraction for impactions of third molars. And through it all, no one intelligently stated the particular malocclusion for which I advocated extraction.

Yes, Dr. Hawley it seems had a case of this kind in his early practice, which from the illustrations he threw upon the screen, appeared to be a bodily upper protrusion, which he presented to show the results that might be expected in following my method of treatment in these cases. If he had had an intelligent understanding of my method of treatment, which was fully published in all the leading dental journals at that time, he would have known that his case demanded a *bodily* retrusive movement of the upper front teeth after extracting the first premolars, and not the application of a single traction arch bow, which, of course, tipped the crowns back and the roots forward. I am wondering if he did not make about as much of a mechanical *faux pas* in the construction of that "half-dozen" retaining appliances which he says he made according to my methods, "that required no special skill." I do not in the least doubt they were failures in his hands, and I certainly wish him every success in the employment of that most primitive of all retainers, rubber plates. Though, judging from the many years of my employment of rubber plate retainers in my early practice, orthodontia certainly would be a failure to me if I had to rely upon that method of retention. But I have this to say in its favor: It certainly is much safer than those spurs and bars soldered to cemented bands resting on enamel surfaces that have been employed so extensively.

I wonder if it is possible that the kind of talk which Dr. Hawley gave in regard to my retaining system—of which he has practically no experience or intimate knowledge—could convince an appreciable number of intelligent members of this society who are acquainted with me and my work, that I would continue to employ this six-band retainer with auxiliary attachments, *for every case* I have regulated for twenty-five years, if it did not fulfill *every* requirement that can reasonably be expected of artificial retention? And I believe it will do the same in the hands of every orthodontist who is capable and willing to put into its construction *that exacting skill which it demands,* and who will see that it is properly taken care of during the time it is worn.

One would think from Dr. Hawley's remarks, that these retainers are left on the teeth without removal, and possibly without being seen during the entire time they are worn, and then at a stated period of two years they are removed without further thought, and as he says, "trusting to luck" as to whether or not the teeth retain their positions. All of this shows that he knows nothing about them from a practical sense. Whereas, the facts are that every patient is instructed how to keep them perfectly clean, especially above the interproximate clips, and then he is warned of the danger of not submitting them to an expert examination as often as once in two months to see that the forces of occlusion, etc., have not started the cement attachments, or that the cement is not being washed out, as it will at times even around the best of cast fillings. If this happens, the appliance must be immediately removed. This is easily accomplished with pliers especially constructed for that purpose. The appliance and teeth are cleaned, and all imperfections corrected before recementing.

It is true that patients at times through necessity or carelessness, do not regard these admonishments, and because of that, disasters arise. But is that not true at times in regard to the care of the teeth in general? Occasionally, but rarely, it will be found that this appliance which is necessarily frail and artistically delicate in construction, does not prevent the strong inherited reactive forces of the original irregularity from moving the teeth in phalanx, though perfectly within the grasp of the cemented bands, and with the appliance reinforced lingually with a No. 28 gauge clasp-metal plate. In one case recently, these same forces caused an original malturned central incisor to break loose from its cement attachments and start to go back, though when attached it was perfectly within the grasp of its cemented band three-quarters of the way around the tooth. It simply required a little firmer attachment. Of course such an event could not possibly arise in Dr. Hawley's hands with a removable rubber plate resting loosely against the lingual and interproximate surfaces of this tooth. But just wait and see what will become of this method of retention in a few years when it has had time to be actually tried out.

I wish to say further that the six-band retainers usually remain on the teeth six months and longer without the necessity of removing them. In one case—that of my own daughter—the retainer remained without a single removal for two years, probably because of its special care, and since that time her teeth have never changed, or shown one ill effect from the retention. Dr. Harper, a noted dentist of Chicago, who cares for them, will vouch for this.

Dr. Hawley is right when he says that no one can tell when to stop artificial retention, except by trial. I have known of a number of cases whose malocclusions arose from heredity, which had been regulated with a view to permanency of retention by rational methods, but which started to revert to their former malpositions after being perfectly retained for two years, but which after being corrected and the same appliance or a new one worn for another six months or a year they never again changed. In these same cases had the entire dentures been shifted to a normal occlusion, nothing on earth could have produced permanency of retention. On the other hand, a large majority of cases in orthodontia arise from local causes and are therefore favorable for retention. *Even pronounced protrusions and retrusions arise occasionally from local causes.* Consequently, in all of these cases, or those which may have arisen in this way, among youthful patients especially, the retaining appliance, after it is worn six months or a year, is commonly left off for a few weeks' or months' trial, and if the teeth retain their positions it is not replaced.

In one case (that of the young woman who will type this manuscript) in which an upper protrusion was corrected after extracting a single premolar at the age of twenty years, the retaining appliance was worn less than six months. Since that time I have frequently shown her teeth to my patients as a type of a perfect occlusion.

Among the many criticisms of this system of retention that have been made *always* by men who have had no correct experience with it, the silliest is that it retains the teeth *''too rigidly in one position,''* and therefore, it is against physiologic principles, and should not be employed. They do not always state exactly why, but leave it to the fertile imagination of others to juggle with. And so Dr. Hawley tells us that he *''does not believe* that many cases will stay after being retained with a rigid retainer such as this for two years,'' etc., etc.

Now let us briefly come right down to the truth of this question of the mechanico-physiologic demands of masticating root movements which has been quite extensively aired of late in papers and discussions upon the question of fixed and removable bridge dentures, and upon which I have expressed a somewhat lengthy opinion from a mechanical viewpoint and incidentally from physiologic and pathologic standpoints. This was read in connection with Dr. H. J. Goslee's paper before the Chicago Dental Society, and published in the September, 1919, *Journal of the National Dental Association.* In the biologic evolution of dentures, one of the functions of the pericemental membranes is to act as cushions in the sockets, to guard against injury or the devitalization of teeth, occasioned from sudden blows in the forces of mastication, etc. Consequently, because of this cushion quality, the teeth throughout untold generations have been caused to move slightly in their sockets under the forces of mastication, and therefore, this movement of the roots has in turn become a coordinating necessity to the health and vitality of the surrounding membranes.

It is claimed that many extensive fixed bridge dentures whose pier attachments are sufficiently strong to prevent them from breaking loose, hold the roots so rigidly in one position that their functional movements in mastication are prevented, and when this goes on for years, the functional activities of the pericemental membranes are impaired, followed by disease, death, etc. This, no doubt, is a true history of many extensive bridges when worn long enough, though it is not so true of small two pier bridges. That is my main objection to fixed bridge dentures which need not be discussed here from a mechanical standpoint.

Now consider for a moment the condition of the alveolar and membranous surroundings of the roots of teeth during and immediately after their orthodontic movements, often with their sockets passing through a profound state of physiologic repair and bone-growth, and compare that with the normal surroundings of vital and pulpless teeth that are employed for bridge dentures, and then ask yourselves if the two conditions come under the same category of argument. Remember also, that Nature's first act before the repair and union of fractures can take place, is to build a firm splint or bony callus to hold the parts immovably in relation to each other. Is it not, therefore, more in accord with physiologic demands to hold the roots of the teeth comparatively still during the processes of permanent repair of their sockets in the new positions, than to employ a removable retainer which every time it goes in and out may produce ten times as much movement to the roots of the loosened teeth as Nature performs in the physiologic movements of mastication? Besides this, the *crux criticorum* of this whole attack upon the six-band retainer is *that it really permits the*

slight physiologic movements of mastication that are necessary for normal activities, because of the yielding quality of its delicate construction.

Were it not for this, the irresistible masticating movements of the teeth which have been known to split the pier roots of bridge dentures in two, would soon completely destroy any retaining appliance that held them rigidly in one relative position. That is really the secret of their stability of attachments. No, you will have to hunt for something stronger than this before you can destroy by words alone the twenty-five years of established utility of this appliance, which during the comparatively short time it is worn, if properly cared for, the teeth and gums are sure to remain in a perfectly healthy condition.

Before leaving the subject of extraction which was so extensively discussed, I wish to say that I have never advocated extraction as an aid to the correction of malocclusions, except in pronounced protrusive malpositions of entire dentures—the upper or the lower, or both dentures—in relation to the esthetic standard of dento-facial harmony *for the individual.*

There are certain things in regard to the correction of these cases *without extraction* that cannot be satisfactorily explained to any one who appreciates and values the possibility of a far greater correction of facial deformed outlines, and a far greater probability of permanency of retention *with extraction,* and who does not believe that the slight difference in mastication between normal occlusions and perfect malinterdigitating occlusions is a sufficient offset to these advantages.

Everyone who has given orthodontia any thought must see that upper dento-facial protrusions, in normal arch widths, with the lower denture and mandible in normal pose, cannot be corrected facially without extraction except by a retrusive movement of the entire upper denture *the full width of a premolar.* This is not to be thought of for many reasons, even if it is possible, and with difficulties greatly increased if the case demands a bodily lingual movement of the front teeth. On the other hand, if the treatment consists in a reciprocal disto-mesial movement of both dentures, with the intermaxillary force, you only half correct the upper protrusion and abnormally protrude the lower. In other words, you produce a partial bimaxillary protrusion. This has been freely pointed out in papers with illustrations from clinical results. But it requires no illustrations, as the statement of the fact is irrefragable. The same is true of lower protrusions with the upper normal. And in regard to the dento-facial correction of bimaxillary protrusions without extraction, one might as well attempt to lift himself with his bootstraps.

Now a few words in regard to heredity, of which I should like to say much, but the present length of my closing remarks will hardly permit. Since my interest and belief in the science of Evolution which began in the early 80's, when I attempted the writing of a weekly column entitled "Evolution" in the leading daily paper of my home town, upon which I received many personal compliments, among which may be mentioned several encouraging letters from no less a man than the late John Fiske, author of *Cosmic Philosophy,* etc., I have always kept in rather close touch with the advancement of biology as an established science, particularly in its branch of anthropology entitled somatology and ethnology. I speak of these things at this time to show that while I claim to have no more intimate knowledge of these subjects than may be ordinarily found among educated people, whatever statements I may make are not founded upon guesswork, or a mere superficial understanding, which too often leads men to express opinions in public they would never think of uttering were they more perfectly informed in regard to the work that has been going on in the world by original investigators and expounders of the truths of evolution and its branches.

I have long been impressed with the belief that one of the principal causes of malocclusion, and the one that has been the greatest stumbling block in diagnosis, treatment, and retention, of our cases in orthodontia, is heredity. Not the kind of heredity necessarily that is popularly in mind when this subject is broached, i. e.,—direct from parent to offspring—for heredity has a number of other branches through whose mysterious channels malocclusions amounting to decided facial deformities are quite as liable to obtain; among which may be mentioned the union of disharmonious types, direct and atavistic, which has been abundantly proved through the remarkable results obtained in the breeding processes by artificial selection, or hybridizing. Furthermore, there can be no doubt in my humble estimation that in countries whose inhabitants are composed of a vast variety of mixed types, as in America,

parental unions arise which fully respond to all the intricate demands of Mendel's law, which is one of the commonly demonstrated laws of heredity in cross-breeding.

If it is true—and as I believe every biologist will agree after giving a little thought to this branch of dentistry—that many of our most pronounced cases of malocclusion arise partly or wholly from heredity in some form, with its undoubted influence upon the advancing science of orthodontia, then we as practitioners and teachers of orthodontia should consider this subject worthy of the profoundest study. It is something which cannot be intelligibly explained in a few words, or even impressively referred to before men who have no foundation knowledge of the elementary principles and laws of biological evolution, any more than the higher branches of trigonometry can be taught to a class of students who only understand the elementary branches of mathematics.

With this in view, with the forthcoming edition of "Dental Orthopedia" I have devoted five chapters to the etiology of malocclusion, besides that which appears in diagnosis and practical treatment of classified irregularities, with the hope of giving to students at least a partial foundation for an intelligent understanding of the laws of heredity and natural variation, which play important parts in the production of malocclusion.

The oft-repeated, and so far as I know, only argument that is used to show that malocclusions cannot arise from heredity is the statement that "abnormalities are not inheritable." This may be briefly answered. But when uninformed persons assert that all children are born with all the physical qualities of perfect anatomical harmony, which they would not deviate from in development were it not for diverting local causes; or the statement made by Dr. Hawley, that when a child is seen to possess the same deforming character of malocclusion that is seen in the parents, that there is no scientific reason for believing that it arose from heredity, but rather that both parent and child were subjected to the same environing cause, or the statement that the moon is a green cheese, if you please, because it looks like it, one cannot effectively combat such statements without presenting lengthy scientific information founded upon well established facts, which is not admissible here.

I wonder if Dr. Hawley upon finding a child with a deformingly large nose would conclude with quite as much reason that it arose from a local cause? And then upon further investigation if he should find the same kind of relatively large nose upon the physiognomy of the father, would he still insist that evidently both parent and child had been subjected after birth to the same local cause, etc., etc.?

No one claims that "abnormalities," interpreted in a pathologic sense, producing at times deformities through perverted nutrition from disease generating bacteria, are inheritable, because every change in form from the primitive state which arises through heredity or natural variation must first be laid down during the metabolism of the fecundated germ cells, which is impossible with every form of microorganism producing disease. But what is important in this connection is: predispositions to these diseases are inheritable, with a far greater tendency toward their development, on the same principle that inherited immunity renders them less possible. All of this, however, has nothing whatever to do with the special phase of our subject, because the term "abnormalities," when rightly interpreted means simply physical anomalies, disharmonies, deformities, etc. And while some of them like cleft-palate arise through interruptions in development during the early stages of utero-gestation, which may be caused by an inherited predisposition toward a lack of normal activity in the embryonic processes to normally unite, shown by several cleft-palate cases in one family or near relatives, and other deformities from traumatic injuries even before birth, still this does not change the rule that all physical disharmonies, natural variations, and anomalies, such as irregular teeth, etc., *are inheritable and pass through the same biologic processes as the normal.* Would you say that ears of deforming size in relation to the otherwise delicate features upon which they are placed have not arisen through some channel of heredity, but arose from a local cause? Or that a prognathous mandible whose protruding malposition has carried the lower denture far in front of a normally posed upper, resulting in a pronounced malocclusion, has arisen solely from some local cause, when such conditions are the well-established possibilities of cross-breeding? And so I might go on naming one proven fact after another that should thoroughly eradicate from the minds of sensible orthodontists that fantastic theory that all malocclusions arise from local causes.

I am often asked why it is that I consider it so important, from a practical standpoint, for orthodontists to believe that heredity and natural variation are among the main causes of dento-facial malocclusion. My answer is: First, because *it is true*—just as true as is the application of the laws of heredity everywhere. Second, because it opens a wide vista for correct diagnosis of many of the most important of our cases, and leads to a rational, effective, consistent, artistic, and permanent system of correction. Third, it eradicates the cut-and-dried rules along mechanical and mathematical lines founded upon an idealized "normal occlusion" as the basis of diagnosis and the one object to be attained at whatever cost.

June 24, 1920. Dr. Hawley has very kindly placed in my hands his revised discussion of my paper. I find it quite different in certain particulars from the stenographic report of his discussion made on the floor of the convention, to which my above closing of the discussion applies, but I feel that I can hardly be expected to cut out my answer to a number of his objections that were made before the society, and which was mailed to the publishers several weeks ago.

Besides a number of garbled quotations in his discussion of my paper, I find that there are two misleading statements in his present discussion, however, which I did not notice in his original one, that I must answer, and preface with the statement that if there is anything calculated to roil an author it is to have an opponent of his principles deliberately misquote him and then follow it with an argument built upon this false premise. He says: "Dr. Case recommends extracting 'all inherited and even long acquired disto-mesial malinterdigitations of the masticating cusps.'" This is an absolute falsehood, deliberately put together to defame my teaching. He has gone far out of his way to find that particular combination of my words which he places in quotation marks, in order apparently to make it appear with his false addition that he has truthfully quoted me throughout, and that I really recommend extraction in all occlusions of that kind. And he takes that quotation right out of the middle of a sentence which has no reference to extraction, but on the contrary, to opening spaces for the insertion of artificial retaining teeth in the treatment of pronounced retrusions of the lower denture in relation to a normally posed mandible and upper denture; a division of Class II of which I have for years stated everywhere in my teaching *that extraction in these cases should be regarded as malpractice.* The whole of the sentence is as follows: "I was, however, coming to the conclusion which I hold today, that all inherited, and even long acquired disto-mesial malinterdigitations of the masticating cusps present conditions that should be disturbed with great caution, if at all, except to adjust the occlusion, and especially with no extensive distal movement of the buccal teeth, upper or lower, except in those cases in which the first permanent molars have drifted forward through the premature loss of deciduous teeth, or from other local causes."

Upon the strength of his false statement that I *recommend extraction* in these cases, he goes on to illustrate cases in which he, Dr. Hawley, corrected them without extraction, just as I used to correct them by shifting the dentures to a normal occlusion, as shown in my Fig. 8, before I learned the danger of extensive disto-mesial movements of the buccal teeth.

The saddest thing to me in this regard is that he and others do not yet recognize the vast differences in character and demands of treatment in pronounced divisions of Class II, which are therefore treated, in the main, all alike under the head of "distal occlusions."

In another place he says: "Dr. Case is *positive* in his statements that *only* those cases that are inherited he treats in that way, and he is *very positive* that he can tell an inherited case." The above quotation which he himself made from my paper disproves this, and nowhere in my paper do I even intimate that I can always "tell an inherited case." The facts are there are many cases which indicate heredity, and should be so regarded in the absence of the possibility of a local cause. But that is a big question which cannot be taken up here.

FAILURES OR UNSATISFACTORY CASES IN ORTHODONTIC PRACTICE*

By Donald S. Sterrett, D.D.S., Erie, Pa.

THE same human instinct which causes people to gather on the street when an accident has occurred, or scan the newspapers each day to find out what ill luck has befallen the various communities of their country, may serve to attract a number of people to attend this session to hear of the misfortunes that have come upon one of their number in his pursuance of orthodontic practice.

It is, however, so difficult to furnish with each case a complete enough history of complications and extenuating circumstances, so that a judgment can be rendered as to the reason for the failure and the party responsible, that that method has been abandoned, and instead, an effort will be directed to show the underlying causes of common failures, and individual cases will be used only to demonstrate a point.

The course of study offered by the Dewey School of Orthodontia, gives to its students, not only a fundamental and working knowledge of the best principles of orthodontics, but also a tremendous zeal and enthusiasm and confidence to go out among the people of their locality and practice the necessary reconstruction so evident on every hand.

To the comparatively large number of young men who have recently taken the course, and are eager for opportunities of expending this enthusiasm, I wish to particularly address my remarks, that their enthusiasm may be tempered by judgment, and their disappointments either be avoided or at least anticipated. And if in these remarks, I, who am also a young man in experience, commit myself in statements which the judgment of the older men find faulty, I trust that these statements may be corrected in the discussion, and that in that way the exposure of my opinions may be a benefit to some of us.

THE DIAGNOSIS OF THE CASE

Some time after opening my practice I find that I developed a tendency of giving rather optimistic estimates at the first examination of a patient, both as to the amount of work required and the expense involved. Some of the results of that tendency I still have with me, and some have been discontinued, mutually unsatisfactory.

From the studies of these case histories I formed the opinion that the time spent in assuring a parent that I could correct a malocclusion would have been better spent in cultivating the interest of the parents in the necessity and desirability of making an honest effort to correct the deformity, and establishing their viewpoint so that they would be willing to put into the case as much in atten-

*Read before the Alumni Society of the Dewey School of Orthodontia, Chicago, April 1-2-3, 1920.

tion to the child and financial assistance as I was giving in service and materials.

That would have obviated the unpleasant interviews in which the parent's main argument is that he understood that the case would be completed in first class shape by a certain time or upon the payment of a certain sum of money, irrespective of whether the patient had been sent away to school for nine months of the year, or had missed as many appointments as he had kept, or had developed tuberculosis or adenoids, or any other of the common causes of incompleted cases.

THE CAUSE OF THE MALOCCLUSION

The cause of malocclusion deserves a place of prominence in the examination and diagnosis, and emphasis placed upon the knowledge of whether the conditions which caused the malocclusion still exist or whether it will reoccur.

Demonstration of this point is found in the Class II case that starts off with encouraging progress shortly after adenoids have been removed and the nasal passages made fit for normal breathing. Then after a series of colds and infections that delay the work, the progress becomes very slow, and normal occlusion is established with great difficulty and the case retained a reasonable length of time. Shortly after the removal of retainers, a startling tendency toward the old malocclusion is noticed, and it will become more noticeable and discouraging until such time as the worried operator becomes suspicious of more adenoids or else some pernicious habit of lip biting or mouth breathing that disturbs the balance of the normal forces of occlusion.

A more remote cause of malocclusion was discovered in a case of rotated upper laterals in a patient of twelve years. The cause was assumed to be prolonged retention of deciduous teeth. The laterals were aligned and retained for a year. During treatment the right temporary canine had been lost and its successor was coming into place, the left temporary canine was still present when the retainer was removed. A year after the retainer was removed the left lateral was again rotated to its original position and x-ray search for further cause of malocclusion showed the left canine impacted against the root of the lateral in nearly horizontal position. The treatment then started consisted of surgically uncovering the crown of the impacted tooth, inserting a pin, and attaching with constant pressure to the arch. After the canine has been brought into proper position, the lateral will again be rotated with the hopes of a permanent result, but the second operation of this case was considerably more extensive than the first, and whether or not sufficient remuneration is received depends upon the attitude and viewpoint which was given to the parent in the early consultations of the case.

THE HEALTH OF THE PATIENT

Lack of attention to the general health of the patient can block the best laid mechanical plans and litter up a practice with unfinished cases that will drag along through a very long time.

One of my perpetual patients is a Class I case of an apparently normal girl starting treatment at the age of twelve. Two years was estimated as sufficient time for the active work, and the fee estimated accordingly, with no complications expected. The case has now been running for four years and still requires

the best part of a year of uninterrupted work to complete. She has already had over two hundred appointments, and has missed, in short periods, a little over a year on account of sickness and vacations. Frequent interruptions caused by illness and making necessary a repetition of work is more disastrous than several months lost on account of one illness followed by good recovery. An amusing incident in this case is the fact that the parent is withholding the sum of ten dollars deducted from his last payment, as a guarantee that I finish the case according to specifications. The inference is that I did not sufficiently impress that man with the fact that the completion of his daughter's work depended upon her health and building powers fully as much as on my skill and ability. Some will say perhaps, that any ordinary person should be able to figure that out for himself. Of course he should, but do not neglect to see that he has done so, or your faith in human nature will cost you a lot of money.

THE INTEREST OF THE PARENTS

The interest of the parents is essential, in getting a thorough history, keeping the patient's dental and physical health up to par, paying an adequate fee so that it will be a pleasure to work on the patient, and making payments promptly so as not to hamper the running of the office and practice.

Many cases would illustrate some feature of this point, but no more forcibly than did my own office records after my absence of twenty-one months in the army. The office was kept open from four to ten days a month by the best orthodontist it was possible to secure, and all patients had opportunity to be seen twice a month. On account of lack of interest, however, some children did not keep their appointments, some tampered with their appliances and lost considerable time, and many were very careless about their payments, thereby cooperating with me to the least possible degree in the necessities of this emergency arrangement, and showing as a result, little progress of cases during that time and barely enough money to keep the office open, even with the most careful management.

And now in conclusion I wish to state that there may be some who overcame these difficulties so long ago that they have almost forgotten them, and will think it stupid of me to take up their time in parading these elementary stumbling blocks, but the fact remains that I have been guilty of error on each of these points. If their exposition will save others from getting into difficulty, I am perfectly willing to be used as an example, and if it should show that I am the only one who is making these mistakes, I can still feel appreciative for being shown my abnormality.

DISCUSSION

Dr. Adelbert Fernald, Boston Mass.—I have been much interested in Dr. Sterrett's paper. There are many things that could be said in discussing a paper like this, as every man has his own method of conducting his business. There is a business side of orthodontia as well as a professional side. We can learn much from the successful business man. If the men here today would state frankly what rules and methods they have found successful in conducting their practices, we would all be benefited by it.

It seems to me, that if any man graduates from a professional school and immediately specializes in any branch (I don't care how much ability he has, or how conscientious he

is) he is going to be handicapped in many ways. Starting in any new line of business or profession there are many things to learn by experience. If a young man could be associated with an older and experienced one, or engage in general practice for a year or two, it seems to me that some of the problems which Dr. Sterrett speaks of could be avoided or made easier.

Some parents will ask how long a time it will take to complete the case, and how much it will cost, etc. To the first question, I will tell them frankly, I do not know, explaining the many causes which might delay the treatment, but that I must have all the time I need. The time used in explaining to the parent the benefits the patient will derive from early orthodontic treatment is well spent. We have in some cases to educate the parent or the patient why these things should be done. When a patient understands the amount involved, he can better understand why the fee should be in proportion to the time and materials used. If one will make models, x-rays, and obtain a full history of their cases, which one can show to the parent or patient, then, if it is necessary to discuss the financial side of the case, one can do so intelligently, as the patient can be shown at least to some extent, what has to be done and why.

Dr. Sterrett refers to the health of the patient. I think that is very important. If the health of the patient be much impaired, he could be referred to the family physician with any suggestions you may think helpful, such as having the adenoids removed, etc., and your treatment of the case deferred. But if the conditions were caused by unhealthy and irregular teeth, of course, the sooner your treatment begins, the better.

Dr. Lloyd S. Lourie, Chicago, Ill.—I certainly have had the same experience as the essayist has had and possibly some others, and I think a consideration of the difficulites to be encountered in our work is one of the most important things that has been neglected. We are apt to be very enthusiastic about the possibilities when we take our cases in orthodontia, and too often the difficulties to be encountered are minimized if they are mentioned at all. So I think any paper of this kind that will bring before the men who are beginning practice, the difficulties they are very likely to encounter is a fine thing. It is a fine thing for the orthodontist and the patient to consider together the difficulties to be overcome and that may be met with in the course of treatment as well as the advantages that may be gained. It is all very well to claim all the probable and possible advantages in orthodontic work, but many times it will come home to you if you overestimate the advantages to be obtained by the work.

Within the last month I had a young woman of thirty come to me; she was very unhappy, and it was a question whether she would ever recover from the results of a too optimistic explanation of the improvement that would accrue to her from orthodontic work. Whoever had done the work for this lady had obtained a good result but had made the mistake of promising too much. Her median line of the upper and the lower arches did not harmonize, and he was going to put these in alignment. She was unhappy because that was not accomplished. It did not amount to anything as effecting a satisfactory results in the case. He told her he would lengthen the upper teeth so that they would show when she smiled, and widening of the arch would fill out her cheeks and make her better looking and everything of that sort. He had not emphasized enough the value of the essentials in the case and he had emphasized a lot of nonessentials. She had better occlusion, and he had checked a progressive tendency toward a mesial occlusion condition. That patient, I am sure, will need quite a great deal of psychologic attention to get her back to normal, if this is ever accomplished I spent considerable time in the case, two or three days in succession, to correct the damage done that patient by a too optimistic prospect being held out to her.

I made the mistake in the beginning of my practice of being too optimistic, as a result of which I believed I could put most all teeth in normal occlusion, and it took several years to find out that I was on the wrong track. Dr. Hellman's paper is a very valuable contribution and will help us to estimate the difficulties we are encountering in treatment, if we adopt such findings as he has presented as a basis and modify them for the individual case.

The length of time it will take for treatment is so variable that we ought to be careful in our estimates; yet I think we should give the patient some idea as to the length of

time it is going to take and the difficulties to be encountered. You should not tell them that you cannot give them any idea of the expense. That is hardly fair; put yourself in the patient's position, and you want some estimate of the time it will take and the expense involved. If we will just adopt that rule, and try to take the patient's point of view, we may many times modify our original plans and findings. The chance to make a good fee should not prevent consideration of whether it would be an advantage to that patient to wait three months or six months or a year. If you were going to wear an appliance, would you want this or that form of appliance? And if you were in moderate circumstances, would you want to make payments in this way or that way. I believe a lot of difficulties can be overcome if we will only put ourselves in the position of the patient and make full explanations.

Dr. Sterrett (closing the discussion.)—Some two possible methods for solving difficulties we encounter were mentioned in the original paper. One would be that if we were enabled to get a fabricated brand which comprises the essential elements of each man's experience and inject that into each new orthodontist he would have the benefit of their experience with which to start out. That is the direct method, and does not seem to have elicited many volunteers. The indirect method which I have found to be efficient is attending these types of conventions and of mingling with thinking men in this branch and thinking men in business and in industrial branches. We meet with keen men of inquiring minds in these conventions, and almost on every occasion we will pick up some possible solution for one of the points harbored in one's mind and will have an opportunity to try it out, which is the fairest possible way, although he may not be able to put into successful practice more than one out of a dozen suggestions which other men might be willing to offer.

DEPARTMENT OF DENTAL AND ORAL RADIOGRAPHY

Under the Editorial Supervision of

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It is the object of this department to publish each month original articles on dental and oral radiography. The editors earnestly request the cooperation of the profession and will gladly consider for publication papers on this subject of interest to the dental profession. Articles with illustrations especially solicited.

A REPORT OF A CASE OF OSTITIS OF THE MANDIBLE WITH AN EXTERNAL FISTULA CAUSED BY A SUPPURATIVE, PROLIFERATIVE PERICEMENTITIS OF A LOWER RIGHT THIRD MOLAR

By M. N. Federspiel, D.D.S., M.D., F.A.C.S., Milwaukee, Wisc.

Professor of Oral Surgery, Marquette University Dental School

MR. W. N., age fifty-nine years; occupation, janitor; weight, 150 pounds, reported at our clinic with the complaint that he had an external fistula of the lower jaw. (See Fig. 1.)

During the past year he had been suffering from a tooth that was sore on palpation, and about six months ago he noticed a swelling of the jaw which lasted from four to five weeks. The mass then became localized to the size of a walnut. On pressure it was found to be firm and immovable.

Two weeks previous to reporting to us, the swelling increased in size and there was considerable pain, which subsided after the pus broke through the skin.

The condition of his mouth as to cleanliness was fair, the mucous membrane normal, and there was no evidence of gingivitis. His physical condition appeared to be normal, the occlusion of the teeth was normal, and the pulps in the teeth were found to be vital. The x-ray showed a marked destruction of bone surrounding the roots of the lower right third molar. Upon passing a probe into the fistula tract, it would lead in the direction of the lower third molar.

We concluded that the patient was suffering from a suppurative, proliferative pericementitis of the third molar, and that the pus had burrowed through the bone and made its appearance on the outside of the jaw.

The patient was operated on under ether anesthesia. After making an external incision, there was found to be considerable bone destruction in the

fistula tract, which led up to the third molar. The tooth involved was then removed, and surrounding the root ends was found to be a large mass of chronic inflammatory tissue. The entire area was thoroughly curetted, and then packed with iodoform gauze which was left to protrude externally.

The patient was then put to bed, and forty-eight hours later the gauze was removed. The wound now appeared healthy and granulating. It was re-

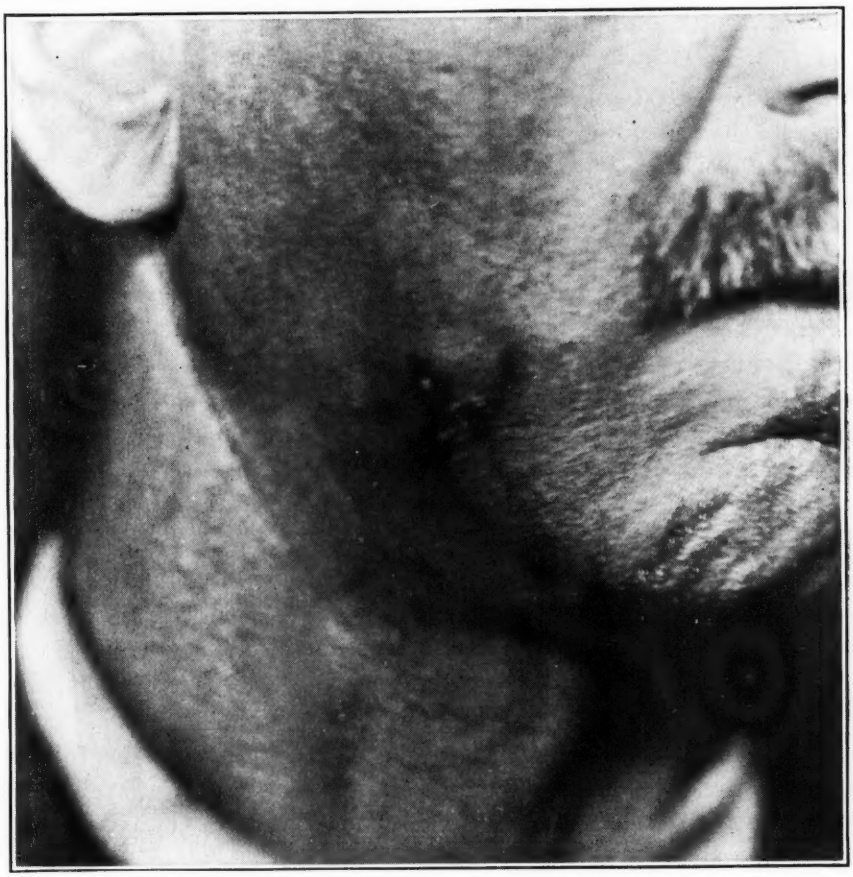

Fig. 1.

packed, and twenty-four hours later the packing was again removed. It was now left open, and six days later the patient was discharged, having fully recovered.

This case is interesting because of the marked destruction of bone with an external fistula, caused by a suppurative, proliferative pericementitis, without any external manifestation of a gingivitis.

ABSTRACT OF CURRENT LITERATURE

Covering Such Subjects as

ORTHODONTIA — ORAL SURGERY — SURGICAL ORTHODONTIA — DENTAL RADIOGRAPHY

It is the purpose of this JOURNAL to review so far as possible the most important literature as it appears in English and Foreign periodicals and to present it in abstract form. Authors are requested to send abstracts or reprints of their papers to the publishers.

Plastic and Cosmetic Surgery of the face. A. G. Bettman. Northwest Medicine, 1920, xix, No. 8, p. 205.

Plastic surgery of the face includes all of its parts; nose, mouth, ears, eyelids, neck, chin and cheeks; plastic work about the nose being probably the most common. Over sixty different operations have been described for the restoration of the nose. Another domain of plastic surgery is the removal of wrinkles of the face and neck, double chins and such like deformities. The location of the incisions in these cases must be given careful study, as their location varies with each case, and strict aseptic technic is essential for good results. A number of cases were successfully operated upon by the author, including the plastic correction of a very marked nasal deformity in a young woman of 24 years, who is said to be now "very proud of her nose."

By means of plastic and cosmetic surgery of the face the following results among others may be obtained. The nose can be made larger or smaller or changed in type; the size of the mouth may also be changed; deformities of the ears are made to disappear; a weak chin can be built out, and hollow cheeks made plump; wrinkles also yield to the touch of the surgeon; ectropion and other deformities about the eye may be corrected. Caution is indicated not only in the performance of the various operations, but also in the promising of results. The scarring which results from cutting operations, although it is as a rule very slight and unnoticeable when the work is carefully done, must be explained to the patient. Hopeless conditions should be let alone, and deformities caused by disease should not be operated on while the disease is active. The injection of paraffin and allied substances for the correction of defects of the nose and about the forehead is not to be recommended.

Epithelioma of the Mouth in a Young Person. P. N. Grant. British Medical Journal, Dec. 13, 1919, ii, p. 775.

The author's observation concerned a lad not out of his teens, aged 17 years and 11 months, who came under treatment for a swelling of the face which he believed to be a gumboil. When working at his trade as an up-

holsterer, he had been in the habit of putting tacks and threads in his mouth, these irritants probably acting as the exciting cause of the disease. The patient's teeth became so loose that he was able to remove with his fingers the left upper second bicuspid tooth and soon afterwards two molars on the same side. The Wassermann reaction was negative. A growth of typical epitheliomatous character was found to involve the left half of the palate with an extension to the right of the middle line. The alveolar margin from the upper second bicuspid on the left side backwards was broken down, and a probe passed into the maxillary antrum gave the sensation of having entered a rather soft mass which bled freely. Two pieces of the growth were removed for microscopic examination, and the specimen was found to consist almost entirely of squamous epithelioma of somewhat active-looking type. Treatment consisted in excision of the left upper jaw, the diseased structures being removed as thoroughy as possible up to and including part of the floor of the orbit. The anterior ethmoidal cells, being involved, were charred out. Subsequently, radium was repeatedly applied in the nostril and externally below the left orbit. The patient made a good recovery from the operation, and for some months his condition was improved, but symptoms developed gradually which indicated extension of the disease to the cerebral centers, and he died about a year later.

A Case of Adamantinoma of the Upper Jaw. F. Weichselbaumer. Wiener Klinische Wochenschrift, 1919, No. 35, p. 881.

Tumors known as adamantinomas, on account of their origin from a special embryonic tissue, the enamel organ, rank nearly first in order of rarity among the tumors of the jaws. The author's observation concerned a man of twenty-nine years who had been operated upon at the age of ten years for a tumor of the right upper jaw; this tumor was said to have developed as a sequel of a tooth-extraction and required about three years for its development; it was situated in the region of the molar teeth and concerned not only the bone, but also the gingiva. At the time, this painless tumor was interpreted as a fibroma and was removed as radically as possible through partial resection of the right maxilla. Upon the basis of the histologic examination, the diagnosis of cylindroma was rendered. Seventeen years later, the patient again observed the development of a thick, hard tumor in the same jaw, which caused no special disturbances. When the patient came under observation, the new tumor was seen to bulge out the region below the infraorbital margin, and to present a nodular surface. The only teeth left in this half of the jaw were the canine tooth and the two incisors. This tumor was removed under ether anesthesia and on the basis of the microscopical findings was pronounced to be an adamantinoma. The patient was discharged ten days later, with a well-healed wound, and free from disturbances.

Concerning the time of the occurrence of these tumors, they may appear from the first to about the fourth or fifth year. In view of the fact that they grow very slowly at first, causing practically no disturbances, their first origin may presumably be referred to the time of puberty, or perhaps still earlier, to the period of dentition. The female sex is said to be somewhat more fre-

quently attacked than the male. The seat of predilection of these tumors is the lower jaw; they are very rarely encountered in the upper jaw. The region of the wisdom teeth is most likely to be affected. Tumors of the upper jaw show a greater tendency to recurrence, but probably only because the superior maxilla cannot be as radically operated upon as the mandible. The diagnosis is usually rather difficult. New growths of this kind are often interpreted as fibromas, osteomas, or even infectious granulomas, especially when the buccal mucosa is also involved and changed through secondary infection. In the majority of the cases, the exact diagnosis is possible only on the basis of the microscopical examination. It has been suggested that the nodular character of the adamantinomas in x-ray pictures may perhaps be utilized in the rendering of the diagnosis.

The Treatment of Parotid Fistula by Resection of the Auriculo-Temporal Nerve. H. de Stella. Le Scalpel, 1920, March 6th.

In a case of parotid fistula following an operation on suppurating and caseous glands in the parotid regions, the auriculo-temporal nerve was resected by the author, after other methods had failed. The salivary secretion was decidedly diminished on the second day following the operation, and the fistula was closed about four weeks later. The success of the operation in such cases is to be explained as follows: The auriculo-temporal nerve supplies the parotid gland with secretory fibers from the otic ganglion, to which they have been brought by the glossopharyngeal nerve by way of Jacobson's nerve and the lesser superficial petrosal. Resection of the nerve causes an arrest of the salivary secretion for a period sufficiently long to permit cicatrization of the fistula.

Radium and X-ray Treatment of Laryngeal Carcinoma. G. Alexander. Wiener Klinische Wochenschrift, 1920, xxxiii, p. 12.

The patient was a man 62 years of age, with epithelioma of the larynx which had invaded the pharynx. Surgical interference was not accepted, and radium combined with x-ray treatment was accordingly instituted, with favorable results, in so far as thirteen months later there was no evidence of metastases, ulceration, infiltration, or cachexia. Although the tumor had not diminished, but actually slightly increased, in size, the new growth judging from the findings on biopsy was made up only of connective-tissue. At the time of the patient's presentation at the Vienna Laryngological Society, his general condition was very good, and all symptoms referable to the growth had subsided, apart from occasional slight local pain and difficulty in swallowing.

Diagnosis of Paradental Cysts of the Upper Jaw. J. Jacques. La Presse Medicale, 1919, xxvii, p. 696.

The designation of paradental cysts is applied to unilocular fluid tumors with serous contents which develop in the substance of the upper jaw, in connection with the root of a carious tooth, and containing no constituents of

the crown. The exclusive localization in the superior maxilla is an important distinguishing feature of these growths. Paradental cysts may appear under two forms, closed and open. The former, when it has reached the surgical state of its development, gives rise to a maxillary deformity involving one or other of the walls, and more or less accessible to exploration according to its location. In the external germs, the resulting protuberance of the cheek or lip is very striking. The affection most nearly resembling closed paradental cyst, in its outer symptomatology as well as in its mode of development, is mucocele of the antrum of Highmore, which likewise deforms without perforating the external table of the maxilla in its different portions. A possibly less rare affection than mucocele, which leads to deformities comparable to those produced by fluid tumors, is sarcoma, a disease showing a certain predilection for the region of the ascending ramus, and sometimes simulating a cyst derived from the lateral incisor or the eye-tooth. The intactness of all the corresponding teeth (paradental cysts developing only on carious teeth), adhesion and early vascularization of the integument, the changed consistance, relative transparence on radioscopy, etc., are usually quite sufficient for the distinction of malignant tumors from benign neoplasms of cystic character. The same considerations would serve as discard or retain the assumption of a primary epithelial cancer of the antrum of Highmore. Osteoma of the maxillary sinus is exceptionally hard on palpation and opaque to radioscopy. The differentiation of paradental cysts from inflammatory swellings of the maxilla sometimes meets with difficulties. Destruction of the wall of a closed paradental cyst opens an avenue of entrance to pyogenic buccal bacteria and results in the formation of a maxillary fistula. This may be permanent or intermittent, according to the degree of virulence of the pathogenic germs and the power of resistance of the tissues. The products of the fistula may be prevalent, or actually offensive, or the secretion may be of serous character, still preserving some of the original features of the cystic gathering. The fistula is always situated in the mouth, usually on the floor of an alveolus, often also in the external gums, much more rarely on the palate. Open paradental cysts with fistula formation may be confused with either sinus inflammation, or with an ordinary chronic dental abscess. However, with an adequate understanding of the anatomo-pathology of paradental cysts, the correct diagnosis does not as a rule prove difficult, and it is often sufficient merely to keep these formations in mind to recognize them in a given case.

Statistics of Lingual Carcinoma. W. Peters. Deutsche Zeitschrift für Chirurgie, 1920, cliv, p. 298.

Among the various localizations of carcinoma, a prominent place is occupied by cancer of the tongue, on account of its extremely rapid course. The more carefully the syphilitic and tuberculous ulcerations are distinguished from the cancerous cases, the more striking is the brief duration of this disease, preceding the initial stage which is almost devoid of symptoms, and the fatal outcome. Notwithstanding the most scrupulous aseptic precautions and improved technic, the permanent results of operations upon lingual cancers still remain more or less unsatisfactory. In the clinics of Garré, in Bonn, as

shown by investigations extending over the last ten years, the survival of patients beyond two years amounted to 15 to 20 per cent. Operations followed by x-ray treatment is nevertheless indicated in all those cases where there is a reasonable expectation of radical removal of the tumor; for although a permanent cure is not to be anticipated, a prolongation of life by several months can be expected on the basis of the results. The average survival of nonoperated patients has been estimated at twelve months, whereas, surgical interference is frequently followed by survival of two years. The deep cervical glands require removal at the same time, operation without extensive glandular removal being incomplete, also when an involvement of the glands is not clinically demonstrable. Technically, the best survey of the field of operation is provided by incisions of the cheek and temporary resection of the jaw.

Remote Manifestations of Focal Dental Infections, with Case Reports. R. Fernandez. The Philippine Journal of Science, 1920, xvi, No. 1, p. 89.

The author emphasizes the fact that hardly any importance has been given to alveolar abscesses as possible causes of serious and remote disorders in the body. The two main dental infections that commonly bear relation to certain forms of arthritis, neuritis, neuralgia, various types of rheumatic manifestations, and certain pathologic conditions in the stomach, the duodenum, the appendix, the gall-bladder, the heart, and the kidneys, as well as blood diseases, such as pernicious anemia, are the apical and periapical abscess and pyorrhea alveolaris. The manifestation of chronic dental infection cannot generally be diagnosed with accuracy by any clinical means without the x-rays, and even with them in certain cases with difficulty. The extra oral method with photographic plates is employed by the author as a routine in dental radiograms, in the Philippine General Hospital; by these means can be obtained not only a large number of teeth, but certain information concerning both maxillæ, especially the upper, in its relation with the nasal cavities and the maxillary sinuses. All the teeth and the maxillæ could be successfully explored with the oblique projection technic, thus detecting any change from the normal appearance of each particular tooth. In the interpretation of the x-ray plates, for the detection of apical abscess, the relation of the natural cavities must be kept in mind, so as to guard against mistaking one of the natural cavities for a shadow produced by an abscess. With the foregoing precaution, it is relatively easy to recognize any abscess developing in or around the dental apex, also in the absence of clinical symptoms, if the negative shows a dark area circumscribed in the dental apex or in the alveolar cavity, and if this dark area is well defined and sharply separated from the neighboring tissues by a line of demarcation. This dark area, a very characteristic radiogram of an abscess, is produced by diminution of density, or decalcification and sometimes destruction of dental tissue. The probable presence of pus in the alveolar cavity is suggested by a very dark, almost black, area.

In ten cases of articular rheumatic, and neuralgic pain, in adult American, European, and Filipino patients, a thorough treatment of the teeth by

the dentist, with extraction if necessary, sufficed to eradicate all symptoms and other disturbances. In instances where a conjoined local treatment by the dentist, and the use of vaccines by the physician, were available, improvement was more rapid, especially when autovaccines were employed. As the symptoms subsided with the disappearance of the focus of infection, the symptomatic manifestations were evidently related to the dental infections. In cases where cultures were made, Streptococcus viridans, associated with Staphylococcus was obtained in one case; in the other, only Streptococcus viridans was found. Vaccine of 100,000,000 per cubic centimeter was prepared from the microorganisms obtained from each patient. Gradual recovery was noted in patients treated by the cure of affected teeth, or by simple extraction, while those who received local treatment associated with vaccine therapy recovered more rapidly.

Malignancies of the Mouth and Neck. E. H. Skinner. Nebraska State Medical Journal, 1920, v, No. 7, p. 194.

Based upon prolonged experience with radium and x-ray, the author points out that there are certain lesions where radiotherapy is absolutely demanded. Radium, according to his experience, is a specific treatment for leucoplakia, the ease with which radium can be applied upon dental-rubber-impression compound to any and all parts of the mouth brings the disease quickly under control. In epulis, the postoperative use of radium is the best insurance against the recurrence of these near-sarcomas of the alveolar portions of the superior and inferior maxillæ. Very small and early lesions may be taken care of by radiation alone. Ostesarcomas of the maxillæ and antrum of Highmore lend themselves to a combination of surgery and radiotherapy. In cancer of the tongue, the use of radium and x-ray furnishes some desirable temporizing features in hopelessly inoperable cases. Early stages of ulceration of the lingual mucosa can be managed with radium to the lesion and through x-ray blocking to the lymphatics of the neck. Every radiotherapist can show results in carcinoma of the lip, and in the various stages. It is worth writing that in malignancies the denser the lesion the more promptly does it respond to radiotherapy. Radium is more reliable than the x-ray in the orifices, sinuses, and upon all mucous membranes. Without sufficient filtration radium gives immediate superficial effects; with filtration and distance, the deeper effects are achieved. Its radius of activity rarely exceeds 2 cm., and unless large amounts are available with heavy filtration, it does not complete with deep Roentgen therapy for cross-fire irradiation through healthy tissues to a deep malignancy.

Bilaterial Syphilitic Parotitis with Left-sided Facial Paralysis. A. Lemierre. Bulletins et Memoires de La Société Médicale Des Hôpiteaux de Paris, 1919, xliii, p. 510.

Syphilis of the salivary glands is a rare affection, and the author accordingly wishes to report a case of bilateral syphilitic parotitis complicated by left-sided facial paralysis, in a soldier 22 years of age. The condition was at first interpreted as a parotid tumor, but improved rapidly under the influence

of specific treatment. The disease developed in the absence of general phenomena and without pain. At the end of a month, both parotid glands had become very voluminous, of wood-like hardness, and left-sided facial paralysis of the peripheral type was present. A cure was very readily obtained under the action of potassium iodide. Although the Wassermann reaction could not be tested and no trace of syphilis could be discovered in the personal and family history of the patient, or in the findings on physical examination, there would seem to be no doubt as to the specific character of the parotitis. The peculiar hardness of the swellings, their indolent character, their development without general and loal reactions, finally the favorable and rapid effect of iodine treatment, are all conclusive arguments in favor of syphilis. The outset of facial paralysis as a complication of voluminous swelling with induration of the parotid is sometimes suggestive of the existence of a malignant tumor of this gland, but in the author's case this diagnosis was rejected on account of the bilateral character of the lesion. Parotid syphiloma may be unilateral, as in a case observed by Morestin. A certain number of instances of tertiary syphilis of the salivary glands have been reported by surgeons who considered it advisable to institute tentative antisyphilitic treatment before proceeding to the removal of the tumor. The value of this measure is illustrated by the author's personal observation.

Chronic Paroxysmal Trigeminal Neuralgia and Its Treatment. W. Harris. British Medical Journal, 1920, i, p. 693.

In taking the histories of cases, the author was impressed by the number in which the pain had definitely started immediately after dental operations or antral abscess. No other nerve in the body, except the second and third divisions of the fifth nerve, is so liable to chronic infection of its branches, and although in some cases even many years have elapsed between the loss of a tooth and the onset of the neuralgia, yet this does not exclude septic neuritis from dental infection as the cause, and when the infection has thus spread backwards into the dental filaments within the jaw it is easily understandable that removal of the tooth does not cure the neuralgia; indeed, it often makes it worse. Dental operations, fracture of teeth, difficult stump extractions give rise to the pain in a certain number of cases. A blow upon the jaw or face may also become the cause of onset of chronic paroxysmal trigeminal neuralgia. This occurred in six of the author's cases. The pain may at first be mistaken for dental neuralgia, but the spasms gradually increase in severity, in spite of the removal of teeth, until at last it is realized that the neuralgia is of the graver inveterate type. Bilateral trigeminal neuralgia is comparatively rare, but twenty-five bilateral cases came under the author's observation and treatment. In the very large majority of unilateral cases, the right side is affected in correspondingly greater frequency, namely in 62 per cent as compared to 38 per cent, in the author's material. He does not know whether any statistics are available of the relative frequency of dental caries on the two sides. Other factors, too, have to be taken into account which may act as the exciting cause for the origin of trigeminal neuralgia.

Regarding treatment, practically the only two methods are gasserectomy and alcohol injection. In the author's opinion, the former operation should never be undertaken until alcohol injection has been thoroughly tried. During the last ten years he has injected the Gasserian ganglion with alcohol through the foramen ovale in 63 cases; in 31 the anesthesia has remained total and no recurrence of pain has taken place. In many of the remainder partial ganglion anesthesia has persisted, though pressure could be felt, yet the relief from pain appears to be equally good. In almost every case as soon as anesthesia develops from the injection (about 1 c.c. of 90 per cent alcohol) the neuralgic spasms cease, and they can no longer be started by any chewing movements, or rubbing the face. The duration of the cure rarely lasts less than twelve months, if good anesthesia has been obtained, and in the majority the relief from pain lasts from two to three years.

Extrinsic Tumor of the Larynx, Cured by Radiotherapy. Trétrop. Revue Laringolgia d' otologie et de Rhinologic, 1920, No. 12, p. 378.

The author reports an observation on a woman 67 years of age, suffering from an extrinsic tumor of the larynx which prevented swallowing, and which was cured in a period of three months, by means of local treatment and deep x-ray applications. The cure dates back to October, 1919. The probable diagnosis was extrinsic malignant tumor of the larynx. The advisability of resorting to x-ray treatment before proceeding to extirpation is emphasized by the author. He raises the question of this mode of treatment which has proved so useful in uterine fibromas, should not be extended to the field of nasopharyngeal fibromas.

Streptococcus Viridans Infections of the Mouth and Throat with Reference to Neuritis and Arthritis. C. H. Hay. Ohio State Medical Journal, 1920, xvi, No. 3, p. 162.

Attention is called by the author to the importance of a thorough search for the focus of infection in the buccal cavity of patients presenting themselves complaining of neuritis, and cases of arthritis which are not accompanied with swelling and fever. It is probably safe to say that lumbago, neuritis, arthritis (without swelling and fever), are merely symptoms of systemic invasion of the chemical toxins produced by a focus of infection, usually the Streptococcus viridans germ. The infection is located at the apex of a tooth, or around a tooth where there is pyorrhea, or in the tonsil crypts, most frequently in the order named. A tooth can have an active apical infection, causing the most painful neuritis of any or all the nerves outside the brain and cord, while the patient may have no discomfort from that tooth, and there need be no discoloration of the gums. As the Streptococcus viridans germ does not produce gas or pus, there is no pressure at the apex and the tooth is not painful. Mere inspection of the teeth and tonsils is not enough for the discovery of an existing infection, but it is necessary to prepare an x-ray picture of the teeth and to make a culture from the tonsil crypts. Bridges, crowns, pivot teeth, and all large fillings should be x-rayed. If a thorough search reveals no focus of infec-

tion in patients who have previously had all their teeth extracted, the gums should be x-rayed for infected roots which might have been left behind at the time of extraction, and a focus is frequently found there. With the author it is routine to have the teeth x-rayed, a culture taken, and a vaccine made for all infections of patients suffering from neuritis and arthritis. In his experience with over five hundred patients, vaccine treatment was found eminently satisfactory.

Meat Diet in Sprue. T. Conran. British Medical Journal, 1920, ii, 206.

Two observations are reported by the author in support of the value of a pure meat diet, even in the most advanced and chronic stages of sprue. The patients were women of 47 and 38 years, respectively, in whom a milk diet had previously failed to cure the disease. The extreme initial emaciation and exhaustion of these two patients, together with their steady progress and complete recovery, under a pure meat diet, are features emphasized by the author. A circumstance worthy of note is the occurrence in the course of each case of tetany, which subsided with the introduction of an exclusive meat diet. The condition in both patients was of protracted standing. In both cases, the premature addition of carbohydrates other than those in fruit, was followed by relapse. The second patient had had pyorrhea alveolaris, and carious teeth, had been extracted, so that the lower teeth were deficient. At the time of admission, examination showed the mucous membrane of the tongue and mouth to be red and sore, with a number of irregular ulcers. The condition of the mouth gradually became normal under appropriate meat diet, which should be instituted as soon as the diagnosis of sprue is made.

The Diagnosis of Dental Neuralgias. H. Kron. Deutsche Medizinische Wochenschrift, 1920, No. 19, p. 516.

Diseased teeth are not infrequently the cause of trigeminal neuralgia, but it is not always easy to decide whether or not the teeth are responsible in a given case. The pain is not necessarily felt in the teeth themselves, or the wrong teeth may be accused by the patient. Psychogenic facial pains may prove very misleading, especially when the teeth are not unobjectionable, as is usually the case. Aside from certain exceptions, where a dental origin is excluded, an examination of the teeth and jaws should be carried out in all cases of trigeminal neuralgia. However, the ordinary methods do not always reveal the source of the trouble, and Roentgen examination fails in the most common cause of neuralgia, namely in the demonstration of pulpitis. Faradization of the teeth is a valuable method, but not yet in general use; moreover, the procedure required skill and experience, and is not applicable in the presence of deeply adjusted metal crowns.

The author was enabled to show that certain reflex relations exist between the teeth and other areas of the trigeminus, as well as the occipital nerves and still more remote districts. Neuralgic earache, often combined with a pain in the temple, which more rarely occurs alone, should always attract attention to the two anterior lower molars, especially the second, when ear-disease can be excluded. The reflex here takes place in the terminal distribution of the auri-

culo-temporal nerve. Temporal pain alone was occasionally observed in diseased conditions of the upper wisdom teeth. Pain in the throat or below the submaxillary angle is encountered in disturbances of the lower wisdom teeth, and corresponds approximately to the maximal point of the upper laryngeal zone of the head.

In contradistinction to psychogenic pains, which are less severe than other dental pains, reflex pains are of a distinctly neuralgic type, although the intervals between the attacks are shorter than in genuine trigeminal neuralgia and may be altogether absent. Both forms are characterized by their definite distribution and uniform manifestation. Long continued dental neuralgia, however, does not remain restricted to its original boundaries, but radiates into other nerve-territories. The grave forms of genuine trigeminal neuralgia, in which the patients anxiously endeavor to avoid all movements of the face, also chewing, are never referable to the teeth. Nevertheless, there are certain cases difficult of interpretation, it is noteworthy in this respect, that genuine trigeminal neuralgias are extremely rare in youthful individuals and hardly ever occur in children. A dental origin of the pain is suggested by this onset, or aggravation, respectively, when the patient lies down. In looking for the source of a neuralgia felt in the teeth, it is necessary to keep in mind also the excentric, menstrual, toxic, malarial, and diabetic neuralgias. The latter have a predilection for the third branch and are apt to be bilateral.

The Administration of Anesthetics. Editorial. The Medical Journal of Australia, 1920, p. 599.

At the Congress of the Dental Association of New South Wales, recently held in Sydney, the use of ethyl-chloride as a general anesthetic for dental operations was recommended, and in this connection the question has been raised, whether a dentist without medical qualifications should be allowed to administer a drug for the purpose of including a state of unconsciousness during an operation. In the interest of the patient's safety, the public should be warned against the practice of allowing dentists to administer a general anesthetic. As long as the law does not forbid unqualified practice, dentists cannot be prevented from taking this considerable risk. The matter is one between the public and the dentist. If the public understood these things and recognized that these rules are necessary for its protection, the practice of the administration of general anesthetics by dentists would soon become limited. In the majority of cases, the dentist would resort to local anesthesia, to the advantage of his patient and to enhancement of his own reputation. When local anesthesia is employed, the dentist accepts the responsibility for the consequences of the drug injected. The public is satisfied to trust the dentist to carry out the injection of the local anesthetic, and the patients would probably not be safer in the hands of a medical practitioner, especially when the latter has not the same manipulative dexterity in dental operations as an experienced dentist.

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EDITORIALS

Some Evils of Commercial Affiliations

ATTENTION has often been called to the fact that the dental profession has been placed in an embarrassing position as a result of close relation with commercial enterprises. The profession as a whole has suffered from the acts of a few with commercial ideas in more ways than one. We have heard the statement that dental science was developed by the commercial men—the dental dealers and the manufacturers. In the face of this statement, we wonder what was responsible for these various trade houses! It is true that many things have been made easier for the dentist by the manufacturer, but that, in our opinion, does not give the manufacturer the privilege of dictating to the dentist what he shall do or what he shall use.

It was only a short while ago that all of the dental journals published in America were controlled by commercial houses; but we are glad to see the

developing tendency of the dental profession to give its support to scientific journals conducted for the benefit of the profession, and not for the advancement of some manufactured article. Dental dealers are necessary; but they should not be permitted to control the dental literature or the dental conventions.

Within the dental profession is found a class of men who are a greater handicap to scientific advancement than is the dental supply house. We refer to the professional man who occupies an enviable position among his fellow practitioners and who is controlled or influenced by commercial relations with some manufacturer or dealer. We have many times seen men very enthusiastically advocate some particular style of treatment or the use of some device in which the output of the drug or appliance required is practically controlled by a commercial house in which the dentist has a financial interest. In some cases these men may be honest in the belief that they are advocating the best known; however, their arguments would sound better if they were not commercially interested. It is very difficult for some men to see anything wrong in an instrument or technic when it contributes to their financial income.

Only recently we had an opportunity of listening to the deliberations of a committee from one of the scientific dental societies. The committee was trying to arrive at some definite conclusion regarding a technical question. On the committee were a few men who were interested in the problem from a purely scientific standpoint and some who may have been interested from a scientific standpoint but who also had decided commercial affiliations. The men who were interested in the report of the committee from a commercial standpoint had much more to say than any one else. They were also determined to block the progress of the committee unless the report gave the commercial advantage to their articles. Three commercial organizations were represented, and each was determined that its side should have a little the best of the committee work. As the work progressed, it became evident that any report suggested not particularly favoring the commercial interests of those present would have a hard time getting before the society. This condition was deplorable because these men occupied high positions in the profession but seemed utterly incapable of setting aside their financial interests for the good of the profession. In spite of the fact that there were so many men who had interests other than scientific, it was with pleasure that we observed some who were interested only in the scientific solution of the problem, and in the end the commercial ideas will be swept away.

Orthodontia has suffered for a number of years from the taint of commercial interests in the sale and advocacy of certain appliances. Unfortunately, many regulating appliances have been patented, manufactured, and pushed by men in the profession as well as by the dental dealers. At the national meeting in Boston, regulating appliances were exhibited and claims made for them that could not be carried out by the average man. Certain appliances are advocated in so-called scientific articles and journals. These are not scientific articles, but mere advertisements re-dressed and placed in the scientific section of the journal. It is the policy of some commercially con-

trolled journals to see that an article is published at frequent intervals by some prominent man in the profession describing some of the appliances manufactured or sold by the house publishing the journal, even though there be nothing new in the appliance or the printed matter.

These commercially inclined individuals are not content to get into print, but often present papers before scientific societies. Recently, influence was brought to bear upon a program committee of a state society by a commercial house, with the result that the committee, unknowingly, invited a man prominent in the profession to read a paper. It developed that the essayist was on the payroll of the commercial house, and the paper was given over to describing a product that the commercial house contemplated putting on the market. Here the society became an ethical advertising medium for the manufacturer's product.

Commercial houses are necessary, but they should be kept in their place; and their place is not the most prominent part of a dental convention, a society program, or a scientific dental journal. The dentist who has commercial ideals should change his calling and become a commercial salesman and not a professional man. Above all, the dental profession must not let commercial men or houses decide the question of professional procedure for them.

ORTHODONTIC NEWS AND NOTES

The editors desire to make this department a permanent feature of the Journal, but in order to do so must have the full support of the orthodontic profession throughout the country. We would deem it a great favor if our subscribers and readers would send in such announcements as might be of interest to the profession.

Annual Meeting of the American Institute of Dental Teachers

The next annual meeting of the American Institute of Dental Teachers will be held at the Claypool Hotel, Indianapolis, Ind., January 24th, 25th and 26th, 1921.

The program will contain much of interest in dental teaching methods and dental educational affairs. A cordial invitation is extended to all ethical practitioners and others interested along these lines to attend the sessions.

DR. ARTHUR D. BLACK, President.
DR. ABRAM HOFFMAN, Secretary,
381 Linwood Ave., Buffalo, N. Y.

The Eastern Association of Graduates of the Angle School of Orthodontia

A regular meeting of the Eastern Association of Graduates of the Angle School of Orthodontia will be held on Monday, November 29th, at the William Penn Hotel, 6th Avenue, Penn Street and Oliver Avenue, Pittsburgh, Pa. The following interesting program has been arranged:

10:00 *A.M. Paper.*
"A Consideration of Impactions," by Dr. Rea Proctor McGee, Pittsburgh, Pa.

11:00 *A.M. Paper.*
"The Results of Recent Experiments with Plants and Animals" (Illustrated by lantern slides and live rabbits from experiments of the speaker), by Prof. H. D. Fish, Department of Zoology, University of Pittsburgh, and Research Associate of the Station of Experimental Evolution of the Carnegie Institution of Washington, D. C.

Discussion:
By Prof. Roswell H. Johnson, Lecturer in Eugenics, at the University of Pittsburgh.

12:00 *Business Meeting.*

2:00 *P.M. Clinics.*
Dr. Lloyd S. Lourie, Chicago, Ill.
The "Concealed labial" arch with spring extensions, alone and in combination with the Lingual Arch. Practical application.

Dr. John V. Mershon, Philadelphia, Pa.
Technic of the Lingual Arch with special reference to the use of auxiliary springs.
Dr. Glenn F. Bowen, Pittsburgh, Pa.
A conservative method of elevating Impacted Cuspids.
Dr. Samuel J. Lewis, Kalamazoo, Mich.
A Cast Attachment for Bite Planes and Retainers. A practical application. Casting Technic.
Dr. Edward L. Mitchell, Indianapolis, Ind.
A Lingual Attachment allowing variable movement of one anchor tooth.
Dr. D. Willard Flint, Pittsburgh, Pa.
Short cuts.
Dr. Guy B. Steadman, St. Paul, Minn.
Slip Tubes, permitting the use of the ribbon and plain arches interchangeably. Secondary Retention for Class II. Div. 2 cases, using inclined planes.
Dr. F. S. Stillwell, Cincinnati, Ohio.
Results with the Ribbon Arch. Slides.
A Modeling Compound Technic.
Dr. Harry J. Horner, Pittsburgh, Pa.
Case showing extensive bodily movement of anterior teeth separated by three supernumerary teeth.
Dr. L. G. Singleton, Pittsburgh, Pa.
Facial variations illustrated diagrammatically.

6:00 *P.M. Dinner at the William Penn Hotel.*

Lecture:

"Hunting Big Game in the Rocks," illustrated throughout with actual scenes from work carried on by the Carnegie Museum of Pittsburgh and other scientific institutions. 120 colored slides. By Arthur S. Coggeshall, Scientific Staff, Carnegie Museum, Pittsburgh, Pa.

Dr. E. Santley Butler, Secretary.
576 5th Avenue, New York City.

Notes of Interest

Dr. F. W. Beesley wishes to announce the opening of offices for the exclusive practice of orthodontia at 501 Mack Building, Denver. Formerly associated with Dr. R. H. Ketcham.

Dr. Charles A. Spahn announces the opening of his office at 560 Fifth Ave., New York City, for the development of dental arches and correction of malposed teeth.

Dr. Harvey Stallard and Dr. Guilhermena Mendell Stallard, formerly of Minneapolis, Minnesota, announce the opening of their office at 247 Spreckels Building, San Diego, California. Orthodontia exclusively.